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The Anthropology of the Brain

4. The Evolution of the Neanderthal Brain: Part II

By DONALD A. SWAN

I

It is among the European or "classic" Neanderthals of the Würm glaciation that we find the final expansion of the hominid brain to modern size. As early as 1863 Thomas H. Huxley noted the "large mass of brain" of the first two Neanderthal crania.¹ The accumulation of numerous additional Neanderthal fossil remains during the following hundred years has served to confirm Huxley's initial observation.

Karl Saller (1959) lists the mean cranial capacity of six "classic" Neanderthals from Western Europe (*i.e.*, Neanderthal, La Quina, Le Moustier, Circeo, La Chapelle, La Ferrassie) at 1521 c.c.² Carleton Coon (1962) provides estimates of the cranial capacity of 13 Neanderthals from Europe and southwest Asia (see Table 1). He also classifies them according to sex. The mean

TABLE 1

Neanderthal and Skhul cranial capacities in cubic centimetres
(Coon, 1962)

<i>Fossil crania</i>	<i>Cranial capacity</i>	
	<i>Male</i>	<i>Female</i>
La Chapelle	1575	
La Ferrassie I	1641	
Neanderthal	1450	
Spy 1	1525	
Circeo 1	1550	
Le Moustier Y	1564	
Gibraltar		1300
La Quina		1350
Spy 2		1425
Tabun 1		1271
Skhul 4	1554	
Skhul 5	1518	
Skhul 9	1587	
<i>Mean cranial capacity</i>	1552	1337

¹ Thomas H. Huxley, "On Some Fossil Remains of Man," 1863, in T. D. McCown and K. A. R. Kennedy (editors), *Climbing Man's Family Tree*, Prentice Hall, Englewood Cliffs, 1972, p. 104.

² Karl Saller, *Lehrbuch der Anthropologie*, Gustav Fischer Verlag, Stuttgart, Germany, Vol. II, 1959, p. 1215; see also Table 3 in Part 1 of my paper, *THE MANKIND QUARTERLY*, Vol. XIV, No. 3, January-March 1974.

TABLE 2
The comparison of Neanderthal and recent races of man in six cranial measurements
(Gieseler, 1959)

Cranial measurement	Neanderthal (G. Schwalbe)	Spy II	La Chapelle (M. Boule)	La Ferrassie (H. Vallois)	Circeo (S. Sergel)	Spy I (J. Fraipont)	La Quina (H. Martin)	Range of mean values for male crania of recent races (R. Martin)
Greatest cranial length	199 mm.	198 m.m.	208 m.m.	209 m.m.	204 m.m.	200 m.m.	203 m.m.	174-187 m.m.
Greatest cranial width	147 m.m.	150 m.m.	156 m.m.	158 m.m.	155 m.m.	140 m.m.	138 m.m.	128-153 m.m.
Smallest forehead width	107 m.m.	106 m.m.	109 m.m.	—	106 m.m.	104 m.m.	100 m.m.	91-101 m.m.
Horizontal circumference	509 m.m.	540 m.m.	600 m.m.	—	590 m.m.	580 m.m.	515 m.m.	497-533 m.m.
Basion-Bregma height	—	—	131 m.m.	134 m.m.	123 m.m.	—	122 m.m.	126-143 m.m.
Cranial capacity	1500 c.c. ¹	1723 c.c.	1620 c.c.	1641 c.c.	1550 c.c.	1562 c.c.	1350 c.c.	1236-1563 c.c. ²

¹ Calculated according to Manouvrier's method.

² Measured by filling the skull with seed or water.

cranial capacity of the nine male Neanderthals is 1552 c.c., with a range of 1450 c.c. to 1641 c.c. The mean of the four female crania is 1337 c.c., with a range of 1271 c.c. to 1425 c.c.³ Dr Wilhelm Gieseler (1959), in his monograph on "The Fossil History of Man," also provides estimates of the cranial capacity of seven "classic" Neanderthals from Western Europe. Included with his estimates are measures of five other cranial dimensions. Gieseler's data are presented in Table 2.⁴ The mean cranial capacity of the seven Neanderthal skulls is 1564 c.c.

The most comprehensive study of the average measured cranial capacities of the various contemporary races and peoples is that of Wilfrid D. Hambly (1947). Dr Hambly employed both formulas and direct measurements in order to "give an accurate summary of all we know of the racial differences." His results are presented in Table 3. As can be seen from the table, "there are two main categories of capacities." One block is the 1400-1500 c.c. group "of Europeans, Mongoloids, American Indians, and Polynesians." The other block is the 1200-1300 c.c. group of "Negroes, Melanesians, Hindus, Tamils, Australian Aborigines, and Tasmanians."⁵

TABLE 3
*Average measured cranial capacities in cubic centimetres
of adult males
(Hambly, 1947)*

<i>Racial group</i>	<i>Mean cranial capacity</i>
1. Europeans (Ancient and Modern)	1488
2. Old English	1472
3. Miscellaneous Mongoloids	1465
4. American Indian and Eskimo	1460
5. Polynesians	1451
6. Fijians and Loyalty Islanders	1439
7. African Negroes	1346
8. Melanesians	1345
9. Hindu and Tamil	1335
10. Melanesians (except Fijians and Loyalty Islanders)	1323
11. Australian Aborigines	1294
12. Tasmanians	1256

³ Carleton S. Coon, *The Origin of Races*, Alfred A. Knopf, New York, 1962, p. 672.

⁴ Wilhelm Gieseler, "Die Fossilgeschichte des Menschen," in Gerhard Heberer (editor), *Die Evolution der Organismen*, Gustav Fischer Verlag, Stuttgart, Germany, Vol. II, 1959, p. 966.

⁵ Wilfrid D. Hambly, "Cranial Capacities: A Study in Methods," *Fieldiana-Anthropology*, Vol. 36, No. 3, 1947, pp. 59-63.

To the extent that Dr Hambly's cranial data are comparable to the capacities listed by Coon or Saller, we observe that the Neanderthal brain was some 3 to 5 per cent larger than the modern European brain (Neanderthal males: $X = 1552$ c.c. and modern European males: $X = 1488$ c.c.). Consequently, it appears that the long-run evolutionary trend towards increased brain size — Australopithecines: $X = 464$ c.c.; Pithecanthropines or *Homo erectus*: $X = 1119$ c.c.; European Early *Sapiens*: $X = 1390$ c.c.; European Neanderthal: $X = 1552$ c.c.; and European Upper Palaeolithic peoples: $X = 1580$ c.c. — virtually reached its maximum in the European Neanderthal population of Würm I.⁶ This maximum brain size was attained in the succeeding European Upper Palaeolithic population of Würm II.⁷ Since then there has been a slight decrease in the size of the brain — as measured by the average cranial capacity of the living peoples of Europe.

Outside Europe the pace of biological and cultural evolution proceeded at a much slower rate — especially in sub-Saharan Africa and South-east Asia. The retarded cultural development of the tropical regions of the world is paralleled by the lower cranial capacities of the inhabitants of these regions — African Negroes, Australian Aborigines, and other tropical primitive peoples (see Table 3).

The Australopithecine stage of hominid evolution persisted for a very long time — from at least 2,500,000 to 500,000 years Before the Present (with some recent Australopithecine finds being dated back as far as 4,000,000 to 5,000,000 years B.P.). During this time hominid evolution proceeded at an extremely slow pace. The cranial capacity of the Australopithecines appears to have remained virtually constant — in the range of 425 to 530 c.c. — for two million years or more. The majority of Australopithecine fossil finds have been obtained from three regions — South Africa, eastern Africa, and South-east Asia. It appears that these early hominids inhabited only the tropical regions of the world. The Australopithecines possessed a simple pebble-tool culture — the Oldowan tradition — which did not make use of fire. It is doubtful that the Australopithecines possessed “true” speech.⁸

⁶ Donald A. Swan, “*Homo erectus*, the Origin of Races, and the Evolution of the Brain.” *THE MANKIND QUARTERLY*, Vol. XIV, No. 1, July-September, 1973, pp. 20-21 and 31.

⁷ Gerhardt von Bonin, “European Races of the Upper Palaeolithic,” *Human Biology*, Vol. 7, No. 2, 1935, pp. 196-221; G. M. Morant, “Studies of Palaeolithic Man, IV: A Biometric Study of the Upper Palaeolithic Skulls of Europe,” *Annals of Eugenics*, Vol. 4, 1930, pp. 109-214.

⁸ Donald A. Swan, “The Australopithecines.” *THE MANKIND QUARTERLY*, Vol. XIII, No. 4, April-June 1973, pp. 228-246.

The Pithecanthropine or *Homo erectus* stage of hominid evolution overlapped both its predecessor Australopithecine and its successor *sapiens* stages. Fossil *erectus* finds 750,000 years or older have been uncovered in central Europe (Heidelberg Man), northern China (Lantian Man), and Java (the Djetis pithecanthropi). On the other hand, late *erectus* fossils — as recent as 25,000 years B.P. — have been found in Africa (Rhodesian Man) and Australia. The *Homo erectus* stage of evolution was characterized by the extension of hominid settlements to the more northern regions of the world — Europe and northern China. During this time period, the more complex Acheulian hand-axe tradition developed in the western part of the inhabited world. Evidence has been uncovered of the use of fire by *Sinanthropus* in north China, some 360,000 years B.P., and much earlier in Europe by the Early *Sapiens* Vértesszöllös man, some 600,000 years B.P.⁹

Cranial capacity more than doubled during the *Homo erectus* stage of evolution. The mean of the male *erectus* finds is 1120 c.c. and that of the females is 970 c.c., with a combined range of 775 to 1280 c.c. The more highly evolved Early *Sapiens* finds from Europe during the time period from roughly 750,000 to 150,000 years B.P. show a higher mean cranial capacity of 1390 c.c. for males and 1293 c.c. for females, with a range of 1170 to 1450 c.c.¹⁰

This large increase in cranial capacity over the Australopithecine stage of evolution is probably associated in part with the expansion of hominid settlement to the more northern regions of the world. The more challenging and varied climatic and ecological conditions in these regions would have altered the pace and direction of natural selection. Krantz (1971) has suggested that the adoption of new methods of hunting — such as “persistence hunting” — with the beginning of big-game hunting as an added food source, played a critical rôle in the doubling of hominid brain size. Persistence hunting requires greater memory retention, which is associated with increased brain size. In Krantz's view, natural selection would have favored those individuals with larger brains and greater mental time spans.¹¹

The growth of the brain in the course of hominid evolution was not uniform. Certain sectors or regions of the brain grew more rapidly than others. Dr Kotchetkova (1960) found three foci of more intense development on the surface of the endocranial

⁹ Chester S. Chard, *Man in Prehistory*, McGraw-Hill, New Hill, 1969, pp. 92-111.

¹⁰ Donald A. Swan, “*Homo erectus*, the Origin of Races, and the Evolution of the Brain,” *op. cit.*, pp. 20-21 and 31.

¹¹ Grover Krantz, *The Origin of Man*, Dissertation Abstracts International, Vol. XXXII, No. 5, 1971.

cast of the *erectus Sinanthropus* fossil. These foci corresponded to the cortical zone of the complex functions of the hand, the language motor zone, and the zone of the somato-topical movements. From her comparative endocranial studies, she inferred that the "first elements of articulate language" emerged during the Pithecanthropine (*Sinanthropus*) stage of evolution.¹²

The continued expansion of the brain in the European Neanderthal population of Würm I and the European Upper Palaeolithic population of Würm II was undoubtedly a result of the intensification of selective pressures during the extreme cold of the Würm glaciation. As Dr Hrdlicka (1927) pointed out nearly half a century ago, the great changes of environment occurring during this glacial period would have called for "new adaptations and developments in hunting" and would have demanded "more shelter, more clothing, more fire, and storage of provisions." The intensification of natural selection would have favored the survival of those Neanderthals with the abilities to meet these challenges.¹³

The European Neanderthals were successful hunters of large game in the first half of the Würm glacial epoch. The first projectile spears appear at this time on the north European plain. The Neanderthals had developed the ability to live on the plains of Europe in a time of cold climate. As Chard (1969) has noted, this implies "construction of artificial shelters" and the use of a rudimentary sort of clothing. The regularity with which hearths are found throughout Europe indicates that Neanderthal man was capable of artificially producing fire.¹⁴

The earliest conscious burials are found in Neanderthal sites in Europe and South-western Asia. The first appearance of a religious sense occurs in Early Würm times, with the possibility of "some sort of skull cult" associated with the Neanderthal find at Monte Circeo, Italy. Other prehistorians have cited evidence of a "bear cult" uncovered at a number of caves in central Europe as "the oldest known beginnings of magic and religion." Dr Chard (1969) in his review of Neanderthal culture concludes that "the behaviour of the men of the Neanderthaloid phase was sufficiently complex to indicate that it must have been motivated by quite abstract ideas, and the repetitive pattern of this behaviour implies that these ideas must have been communicated by the use of conventional symbols — suggesting the

¹² V. I. Kotchetkova, "L'évolution des régions spécifiquement humaines de l'écorce cérébrale chez les Hominidés," *Proceedings Sixth International Congress of Anthropological and Ethnological Sciences, Paris*, Vol. 1, 1960, pp. 623-630.

¹³ Ales Hrdlicka, "The Neanderthal Phase of Man," 1927, in T. D. McCown and K. A. R. Kennedy (editors), *op. cit.*, pp. 282-283.

¹⁴ Chester S. Chard, *op. cit.*, pp. 120-122.

existence now of vocal communication at least approaching our concept of language.”¹⁵

Sally Binford and Lewis Binford (1968; 1969) have statistically analyzed — by means of multivariate procedures, such as factor analysis — stone implements and other objects obtained from a number of Mousterian sites in an effort to determine their functions and to understand the organization of Neanderthal economic and social life. Sally Binford (1968) found evidence that during the Early Würm period, Neanderthal man in the Levant “differentially exploited three climatic zones” and “increasingly exploited the ecotones of the region.”¹⁶

In a comparative study of two Mousterian sites in South-western Asia and one in France, Sally Binford and Lewis Binford (1969) found that 40 different classes of Mousterian tools formed five distinct clusters or factors, representing: (i) “activities conducted at a base camp”; (ii) “a kit of related tools for hunting and butchering”; (iii) “a tool kit for the preparation of food”; (iv) “tools employed in the processing of plant materials”; (v) “a more specialized hunting and butchering tool kit.” The authors also noted that “some of the data from Jabrud even provide a hint of a division of labor by sex in the Middle Palaeolithic.” The Binfords conclude that on the basis of archaeological evidence collected in recent years, “the behavioral capacities of Neanderthal man were not markedly different from our own.”¹⁷

Alexander Marshack (1972) has recently revised many of our conceptions of the complexity of the European Upper Palaeolithic cultures and of the intellectual capabilities of Upper Palaeolithic man in Europe by presenting evidence of the development of a system of notation and of a lunar calendar at this early time period (B.C. 35,000 to 10,000). In his investigations Dr Marshack has employed concepts derived from Piaget’s studies of cognitive development together with new analyses of the art and culture of Upper Palaeolithic Europe. Although he has concentrated on “the evolved and complex time-factored cultures of the late Pleistocene” or Upper Palaeolithic Europe — which he contends “provided the crucial preparations for the Mesolithic and Neolithic” cultures — Marshack has also briefly considered the earlier evolution of man’s cognitive and intellectual capacity.¹⁸

¹⁵ Chester S. Chard, *op. cit.*, p. 123.

¹⁶ Sally R. Binford, “Early Upper Pleistocene Adaptations in the Levant,” *American Anthropologist*, Vol. 70, No. 4, 1968, pp. 707 and 713.

¹⁷ Sally R. Binford and Lewis R. Binford, “Stone Tools and Human Behaviour,” *Scientific American*, Reprint No. 643, 1969, pp. 6-7.

¹⁸ Alexander Marshack, *The Roots of Civilisation*, McGraw-Hill, New York, 1972, pp. 81-340.

Dr Marshack believes that emphasis should be shifted from "the skills of toolmaking and language as the primary expressions of hominine culture and culture transmission to a broader, more inclusive, and more generalized human capacity," which he terms a "time-factoring" capacity. "Time factored" processes are those processes which have measurable or estimable duration, which are periodic, sequential, *etc.* For example, the abstract skill of numbering is "a symbolizing and cognitive process," which is always "time-factored" and "time-factoring." It is the evolution of this "broader, time-factored and time-factoring capacity, including the skills of toolmaking and language, that leads eventually to the notations and art."¹⁹

As early man moved into the northern latitudes, with their sharper seasonal differences, he had moved into "the problems of a widening, increasingly complex and dynamic time-factored geometry. In part this was based on the periodicities of nature, in part on his own self-created, self-domesticating, artificial culture, and in part on his evolving anatomy and brain." It is the contention of Dr Marshack that "it was the interrelation of these factors that played a selective part in evolution, choosing those who could best think and function 'in time.'" Consequently, the increasing capacity for creating and maintaining more complex levels of hominid behavior is regarded as having its basis "in the time-factoring and time-factored processes and potentialities of the evolving and expanding brain."²⁰

Dr Marshack believes that early in the *Homo erectus* stage of evolution, some 700,000 to 400,000 years ago, "man had evolved sufficiently to create and maintain a complex time-factored culture. The root of this capacity was the enlarged brain with its evolved, specialized structures and processes for visual and kinesthetic coordination, conceptualization, memory, and cross-referencing." Then, somewhat later Peking Man (*Sinanthropus*) is able to form useful chopper or scraper tools and to make use of fire. This increased kinesthetic thinking has resulted from "a larger brain in a more evolved body, probably capable of a wider walking, running, hunting, and foraging range."²¹

By the time of the Neanderthals, Dr Marshack finds that "the stone tools are exquisitely conceived and wrought, and the range of specialized tools, points, and edges comparatively large."²² The large-brained Neanderthal man also "used bear skulls ritually, structured his sanctuaries, buried ceremonially, used red

¹⁹ Alexander Marshack, *op. cit.*, pp. 14-15, 25, and 118.

²⁰ Alexander Marshack, *op. cit.*, pp. 116-117.

²¹ Alexander Marshack, *op. cit.*, p. 134.

²² Alexander Marshack, *op. cit.*, p. 135.

ocher," and "may have made crude notational marks." Although he was "not apparently a large maker of 'art'," Marshack finds that the "Neanderthal use of bear skulls is not far from *Homo sapiens*' use of the engraved or painted image." At this stage in his investigations, Dr Marshack concludes by asking whether the disparities between the European Upper Palaeolithic cultures, with their highly developed art and notational system, and the earlier Mousterian cultures of Neanderthal man are due to differences "in the brain or in the culture, or, as seems likely, in some aspect of both?"²³

II

Endocranial casts have been constructed from several Neanderthal crania. These include the European Neanderthals from La Chapelle aux Saints, La Quina, Duesseldorf, and Gibraltar and the African "Neanderthaloid" from Broken Hill, Rhodesia. Discussions of the features of the Neanderthal brain have been provided by Boule and Anthony (1911),²⁴ Anthony (1913),²⁵ Elliot Smith (1927),²⁶ Ariëns-Kappers (1929),²⁷ Hrdlicka (1930),²⁸ Connolly (1950),²⁹ Kotchetkova (1960),³⁰ and von Bonin (1963).³¹

The cranial capacity of the skull from La Chapelle aux Saints had been estimated by Marcellin Boule at about 1600-1620 c.c. The endocranial cast made by Boule and Anthony of this Neanderthal fossil showed a large, but low, brain (see Figure 1). The morphological characteristics of the La Chapelle brain were grouped by Boule and Anthony into two categories. The distinctly human characteristics were described as: "Large absolute

²³ Alexander Marshack, *op. cit.*, p. 370.

²⁴ Marcellin Boule and R. Anthony, "L'Encéphale de l'homme fossile de La Chapelle-aux-Saints," *L'Anthropologie*, Vol. 22, 1911, pp. 129-196.

²⁵ R. Anthony, "L'Encephale de l'homme fossile de La Quina," *Bulletin et Memoires de la Société d'Anthropologie de Paris (6th Series)*, Vol. 4, 1913, pp. 117-195.

²⁶ Sir Grafton Elliot Smith, *Essays on the Evolution of Man*, Oxford University Press, Oxford, England.

²⁷ C. U. Ariëns-Kappers, *The Evolution of the Nervous System in Invertebrates, Vertebrates, and Man*, DeErven F. Bohn, Haarlem, Holland, 1929, pp. 221-247.

²⁸ Ales Hrdlicka, *The Skeletal Remains of Early Man*, The Smithsonian Institution, Washington D.C., 1930.

²⁹ Cornelius J. Connolly, *External Morphology of the Primate Brain*, C. C. Thomas, Springfield, Illinois, 1950, pp. 331-349.

³⁰ V. I. Kotchetkova, *op. cit.*, pp. 623-630.

³¹ Gerhardt von Bonin, *The Evolution of the Human Brain*, University of Chicago Press, Chicago, Illinois, 1963.

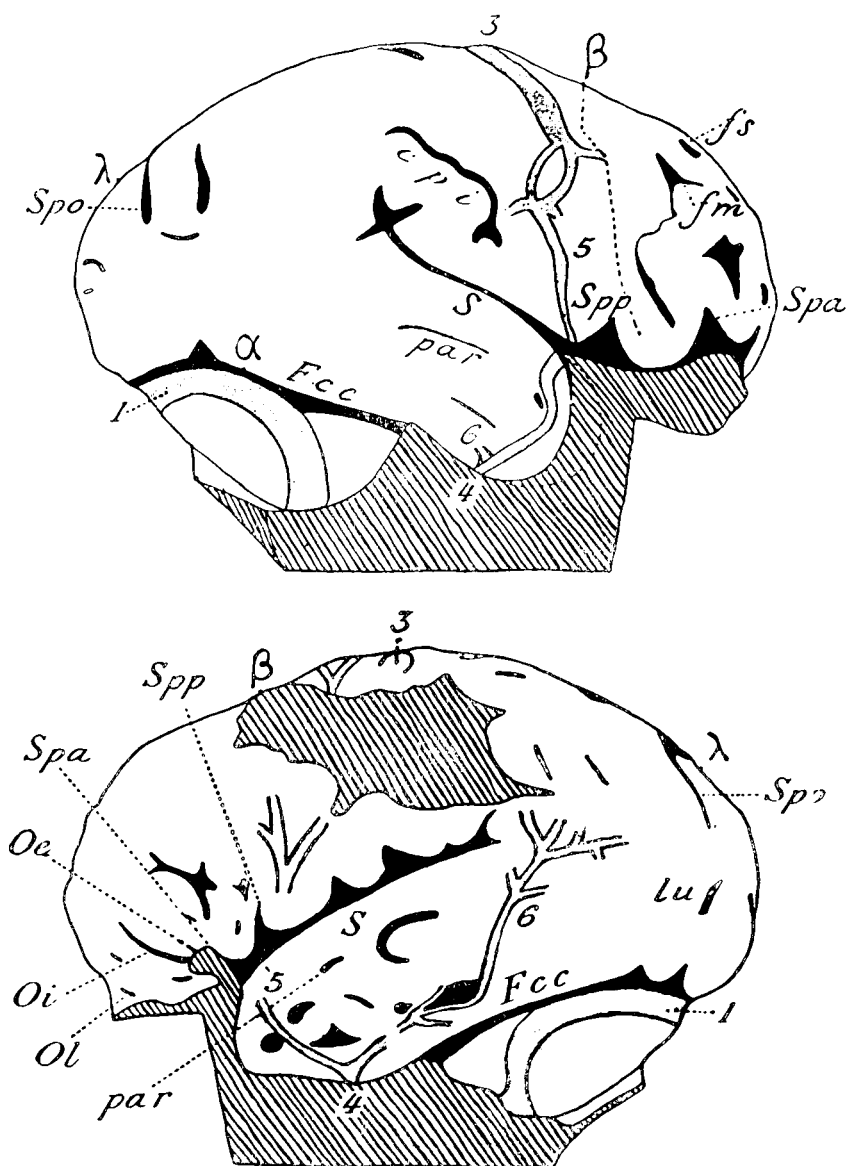


FIGURE 1

Endocranial cast of the La Chapelle-aux-Saints skull — right side at top and left side at bottom (Boule and Anthony, 1911).

volume; predominance of the left hemisphere; the presence of two presylvian branches, and of a human system of opercula.”³²

The characteristics “intermediary between those of the anthropoids and man” were described as: “. . . the general simplicity and gross aspect of the convolutions; the position and direction of the sylvian and rolandic fissures; the differentiation and length of the parieto-occipital fissure; the reduction of the frontal lobes, especially in their anterior region; . . . the primitive character of the third frontal convolution which was probably devoid of the basal part; the presence of a much developed *sulcus lunatus*. . . .” Boule and Anthony concluded that: “On the whole the brain of the fossil man of La Chapelle-aux-Saints is already a human brain by the abundance of its cerebral matter,” but that “this matter still lacks the higher organization which characterizes that of present man.”³³

The Neanderthal skull from La Quina is much smaller than the one from La Chapelle, with the cranial capacity listed by Coon and Gieseler at 1350 c.c. However, Dr Coon considers this skull to have been that of a female. If this diagnosis is correct, then the cranial capacity of the La Quina fossil is close to the mean for living European females. According to Hrdlicka (1930), the form of the La Quina brain “was much the same as that of the other Neanderthal subjects, particularly those with the narrower skulls.” The relative development of the cerebral lobes “was almost identical in the La Quina and the La Chapelle brains.” The *sulcus lunatus* was present in the La Quina brain, “as in the La Chapelle and the Neanderthal brains.”³⁴

Dr Hrdlicka described the morphological characteristics of the La Quina brain as follows:—

. . . There is a very marked smallness of the frontal lobes, a considerable overhanging of the occipital lobes of the cerebrum, and a marked separation of the two halves of the cerebellum. The left hemisphere shows a somewhat better development than the right, though the right appears to have been slightly longer. The convolutions of the La Quina brain were less simple and gross than those of the man of La Chapelle and Neanderthal, without reaching the average of the European brain of today.

Hrdlicka, in his review of Anthony’s study of the La Quina brain, concluded that “in detail the brain presented some

³² Ales Hrdlicka, 1930, *The Skeletal Remains of Early Man*, *op. cit.*, p. 267.

³³ *Ibid.*

³⁴ Ales Hrdlicka, *The Skeletal Remains of Early Man*, *op. cit.*, p. 291.

characteristics of inferiority, while in others it approached that of recent man."³⁵

The features of the brain cast of the original Neanderthal find from Duesseldorf, Germany — that of an adult male — have been reviewed by Ariëns-Kappers (1929) and Hrdlicka (1930). According to Dr Hrdlicka, the brain which filled the Neanderthal skull "was lower and narrower and slightly more pointed than the human brain of today, approaching in these features more the anthropoid form." He also noted the presence of some asymmetry between the cerebral hemispheres, with the right frontal lobe being slightly larger and longer than the left," and the whole right hemisphere "slightly longer than that of the opposite side."³⁶

Dr Ariëns-Kappers observed that the lunate sulcus "is only clearly visible behind the sutura lambdoidea on the left occipital lobe of the Duesseldorf cast, where it shows a similar relation as may be observed in recent men." On both sides of the Duesseldorf cast "the inferior frontal sulcus is interrupted in its horizontal course by a posterior and anterior frontal bridging convolution (also described in recent men, Eberstaller), connecting the inferior with the mid-frontal convolution behind and in front of the intermediate fosset 8, which thus acquires an arched shape on these lobes."³⁷

The skull of a five-year-old Neanderthal child had been discovered in 1926 by Dorothy Garrod at Devil's Tower, Gibraltar, near the Forbes Quarry site where an adult Neanderthal skull had been uncovered in 1849. The features of the endocranial cast of the brain of the Gibraltar child were studied by Sir Grafton Elliot Smith (1928). He concluded that the child "was a normal representative of the Neanderthal species, with an exceptionally high development of the prefrontal region of the brain and a temporal area that was rather below the average size." Elliot Smith also contended that the high development of the prefrontal area of the Gibraltar skull contrasted with the meager development of this region in the Galilee and La Quina skulls.³⁸

Professor Ariëns-Kappers (1929) compared the brains of several European Neanderthals with those of recent Europeans and the much earlier *Pithecanthropus* fossil. He noted that "the brains of Neanderthal men were much larger than that of *Pithe-*

³⁵ *Ibid.*, p. 291.

³⁶ Ales Hrdlicka, *The Skeletal Remains of Early Man*, *op. cit.*, p. 155.

³⁷ C. U. Ariëns-Kappers, *op. cit.*, p. 237.

³⁸ Dorothy Garrod, with L. H. D. Buxton, G. Elliot Smith, and D. M. A. Bate, "Excavation of a Mousterian Rock-Shelter at Devil's Tower, Gibraltar." *Journal of the Royal Anthropological Institute*, Vol. 58, 1928, pp. 19-113.

canthropus, about equally large as recent human brains." Ariëns-Kappers also observed that "although the general shape of the casts shows a great deal of difference with recent man, there is, however, a still greater difference between Neanderthal casts and that of *Pithecanthropus*."³⁹

The Neanderthal cast differed from that of *Pithecanthropus* "not only by its skull capacity but also by its greater height indices and broader *frontal lobe*." Consequently, the frontal width of the Neanderthal brain "contrasts less with the temporal width than it does in *Pithecanthropus*." In comparison with the brains of recent Europeans, the Neanderthal "*frontal and occipital height indices* are smaller and the *temporal lobes* may have been more turned inside. . . ."⁴⁰

Dr Ariëns-Kappers found that in some of the Neanderthal endocranial casts the fissures on the orbital and frontal lobes were "sufficiently clear to allow a comparison with the *Pithecanthropus* and recent man. . . ."

"A great variety is observed in the *inferior frontal sulcus*, which on the left lobe of the La Chapelle man and La Quina woman in addition to a *ramus inferior* has also a *ramus anterior* (r.ant.), not occurring in the *Pithecanthropus* nor in the chimpanzee." Ariëns-Kappers found it striking that in the Neanderthal endocasts previously examined, the *ramus anterior* "is best pronounced on the left lobe." Dr Ariëns-Kappers contended that in recent man "under this fissure, partly also under its anterior branch, lies the subregio frontalis inferior of Brodmann which on the left acts a part in speech." Furthermore, in comparison to *Pithecanthropus*, the inferior frontal convolution "has enlarged dorsally and frontally."⁴¹

Dr Ariëns-Kappers reached the following conclusions in his comparative study of the features of the brains of *Pithecanthropus*, Neanderthal man, and *Homo sapiens*:⁴²

Resuming we may say that Neanderthal brains are more primitive than recent human brains by being more flat, having a pronounced orbital keel starting far above the lateral horizontal, a concave orbital plane, a large petrosal impression, a long occipital and rather blunt temporal lobe the anterior part of which has a deep ventral extension.

The fissures of Neanderthal men differ from those of *Pithecanthropus*, by showing a distinct dorsal and frontal enlargement of the inferior frontal convolution, an increase of

³⁹ C. U. Ariëns-Kappers, *op. cit.*, pp. 230-231.

⁴⁰ *Ibid.*

⁴¹ C. U. Ariëns-Kappers, *op. cit.*, p. 233.

⁴² C. U. Ariëns-Kappers, *op. cit.*, p. 238.

the foot of the midfrontal convolution and backward shifting of the lunate sulcus.

In their original study of the La Chapelle-aux-Saints brain, Boule and Anthony (1911) inferred that this Neanderthal brain "had a much reduced foot of the third convolution or perhaps lacked this part entirely." They thereafter concluded that "La Chapelle man probably lacked the power of articulate speech, or at least possessed only a rudimentary form of it." C. S. Connolly (1950), however, has criticized "this rather harsh conclusion" as "not necessary."⁴³

Dr Connolly in his review of the endocranial casts of prehistoric man found the midfrontal sulcus and the inferior frontal sulcus on the right side of the La Chapelle endocast to be "well developed." He added that "there does not appear to be sufficient reason to conclude with Boule and Anthony that the brain of La Chapelle-aux-Saints man was more simply fissured than in many specimens of modern man."⁴⁴ Hrdlicka similarly commented that the "inferior characteristics" of the La Chapelle brain described by Boule and Anthony may "be somewhat over-emphasized, and that most if not all of them could individually be duplicated in the more primitive brains of today."⁴⁵

Dr Connolly also noted that "the frontal region of La Quina appears to have enlarged over that in *Pithecanthropus* and *Sinanthropus* as indicated by the presence of a branch of the inferior frontal sulcus lying anterior to the orbital cap in La Quina, while the sulcus in the former two specimens terminates within the orbital cap."⁴⁶ Hooton (1946) describes the outstanding feature of the brain casts of Neanderthal man as "the prominence of the inferior frontal convolution (the speech area)," which is more developed than in either *Pithecanthropus* or *Sinanthropus*. Dr Hooton cited F. Tilney, the author of *The Brain from Ape to Man* (1928), as regarding "this frontal development as indicative of psychic powers in advance of the more primitive types and of a capacity for speech approaching modern standards."⁴⁷

Boule and Anthony (1917) also calculated the ratio of the surface area of the frontal lobes to the total cerebral surface, obtaining the following figures: 32.2 per cent for the anthropoid apes, 35.0 per cent for Neanderthal man, and 43.3 per cent for

⁴³ Cornelius J. Connolly, *op. cit.*, p. 345.

⁴⁴ Cornelius J. Connolly, *op. cit.*, p. 347.

⁴⁵ Ales Hrdlicka, *The Skeletal Remains of Early Man*, *op. cit.*, p. 267.

⁴⁶ Cornelius J. Connolly, *op. cit.*, p. 348.

⁴⁷ Earnest A. Hooton, *Up From the Ape*, The Macmillan Co., New York, 1946, p. 332.

modern man.⁴⁸ According to Hooton, Dr Tilney concluded that the brain casts of Neanderthal man demonstrate "an expansion of all the lobes in comparison with those of *Pithecanthropus*," with "the frontal lobe proportionately less expanded than the other parts of the cerebrum." The Neanderthal parietal lobes "are greatly expanded," while the occipital lobe, "the visual and visuopsychic areas show important increments." The temporal lobe is also regarded as "well-developed," with "a large auditory eminence, which is generally accepted as a part of the speech mechanism."⁴⁹

Von Bonin (1963) applied von Economo's encephalometric scheme to the endocasts of a series of fossil skulls in order to investigate evolutionary changes in the brain. Absolute measurements were taken at a number of points on the fossil endocasts. From these data, a series of encephalometric indices were computed. On the basis of these figures, Dr von Bonin concluded that in the Neanderthals, "the parietal lobe appears to increase at the cost of the frontal lobe."⁵⁰ However, Holloway (1968) has criticized many of these earlier studies and doubts "the commonly held view that man's frontal lobes have shown a relative increase" in the course of evolution. He contends that "a better case may be made for relative increase of parietal and temporal association cortex in the case of man."⁵¹

Students of the brain have recently renewed interest in the localization of language function in the human brain and in the functional significance of cerebral asymmetry. Norman Geschwind (1972), for example, has proposed a model of how the language areas of the human brain are organized from studies of aphasias, or speech disorders, caused by brain damage. The primary language areas of the human brain are believed "to be located in the left hemisphere, because only rarely does damage to the right hemisphere cause language disorders."⁵²

Broca's area, which lies in the third frontal gyrus and is adjacent "to the region of the motor cortex that controls the movement of the muscles of the lips, the jaw, the tongue, the soft palate and the vocal cords, apparently incorporates programs for the co-ordination of these muscles in speech." Damage to

⁴⁸ Marcellin Boule and R. Anthony, "Neopallial Morphology of Fossil Men as Studied from Endocranial Casts," *Journal of Anatomy and Physiology (Third Series)*, Vol. 12, 1917, pp. 95-120.

⁴⁹ Earnest A. Hooton, *op. cit.*, pp. 329-332.

⁵⁰ Gerhardt von Bonin, *op. cit.*, pp. 56-57.

⁵¹ Ralph L. Holloway, "The Evolution of the Primate Brain: Some Aspects of Quantitative Relations," *Brain Research*, Vol. 7, 1968, pp. 138-140.

⁵² Norman Geschwind, "Language and the Brain," *Scientific American*, Vol. 226, No. 4, 1972, pp. 76-83.

this region of the brain "results in slow and labored speech, but comprehension of language remains intact." Wernicke's area lies between Heschl's gyrus, "which is the primary receiver of auditory stimuli, and the angular gyrus, which acts as a way station between the auditory and the visual regions." Damage to this area impairs comprehension and results in speech that "is fluent but has little content." Broca's area and Wernicke's area are connected by a nerve bundle called the arcuate fasciculus. Damage to these nerves results in "fluent but abnormal speech."⁵³

In most animals the structure of the nervous system is essentially symmetric. In man, however, the two cerebral hemispheres are anatomically asymmetrical and "differ greatly in their functions." Geschwind and Levitsky (1968) found that the planum temporale, an extension of Wernicke's area, "was larger on the left side of the brain in 65 per cent of the cases," and that in most people "the left cerebral hemisphere plays a dominant rôle in speech."⁵⁴ Doreen Kimura (1973) has investigated the auditory asymmetries of the brain by employing dichotic listening tasks. She found that the right cerebral hemisphere "plays a dominant rôle in man's perception of his environment," including the perception of melody. Dr Kimura also reported "sex differences in verbal and nonverbal asymmetries," which led her to conclude that "for some intellectual functions the brains of males and females may be differently organized." She suggested that these sex differences in the brain may have resulted from the differential operation of selection processes in societies where the males specialized in hunting, so that "accurate information about both the immediate and distant environment was of paramount importance."⁵⁵

Sir Grafton Elliot Smith (1928) in his studies of the evolution of the human brain found an increase of "three significant cortical areas in the Human Family" — the parietal, prefrontal, and temporal cortex. He believed that "the origin of speech can be brought into logical connexion with the other factors that are expressed in the expansion" of these areas of the brain. Dr Elliot Smith found "a very pronounced local growth of the posterior part of the second temporal convolution" on the endocranial cast of *Pithecanthropus*. He interpreted this as indicating that *Pithecanthropus* "had already acquired some sort of speech."⁵⁶

⁵³ Norman Geschwind, *op. cit.*, p. 78.

⁵⁴ Norman Geschwind and Walter Levitsky, "Human Brain: Left-Right Asymmetries in Temporal Speech Region," *Science*, Vol. 161, No. 3837, 1968, pp. 186-187.

⁵⁵ Doreen Kimura, "The Asymmetry of the Human Brain," *Scientific American*, Vol. 228, No. 3, 1973, pp. 70-80.

⁵⁶ Sir Grafton Elliot Smith, *op. cit.*, pp. 172-173.

Dr Kotchetkova (1960) similarly placed the emergence of “the first elements of articulate language” at the *Sinanthropus* or *erectus* stage of evolution. In the case of the Neanderthals, she found that the three specifically human regions of the brain — the extremity of the Sylvian fissure, the posterior part of the inferior frontal convolution, and the region of the impression of the coronary suture — remain “the focus of an intense growth.” The three regions become further differentiated with respect to the processes of growth. It is the posterior epicenter of the inferior parietal focus “which has become the most intense focus of development.” Dr Kotchetkova concluded that the growth of the inferior frontal parts of the endocranial cast of the Neanderthals “gives indirect evidence of the process of a subsequent development of language.”⁵⁷

Sir Grafton Elliot Smith (1928) also found the asymmetry of the brain to be “characteristic of the Human Family as a whole.” He observed that cerebral asymmetry was revealed in many of the fossil endocasts. The brain casts of the European Neanderthals, such as La Chapelle, generally indicated an asymmetry of the cerebral hemispheres. On the other hand, in

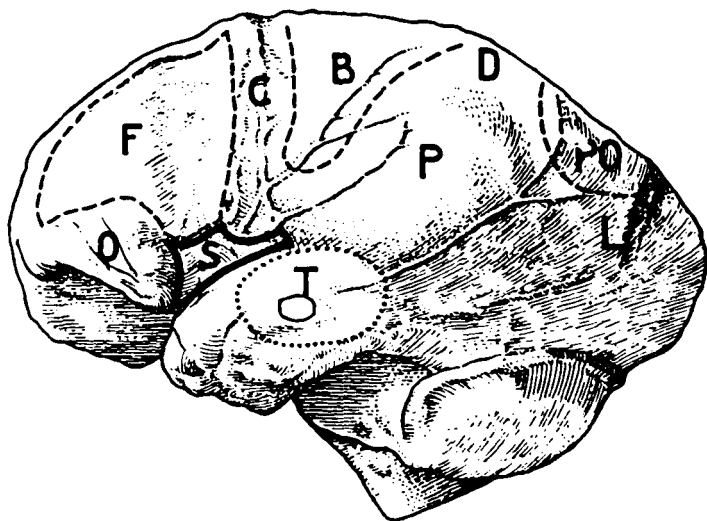


FIGURE 2

Endocranial cast of the African *erectus* skull from Broken Hill, Rhodesia (Elliott Smith, 1928).

⁵⁷ V. I. Kotchetkova, *op. cit.*, pp. 627-630.

the cast of the brain case of Rhodesian Man — the late *erectus* fossil from sub-Saharan Africa, which Carleton Coon believes to be ancestral to living African Negroes — “the lunate sulci are as nearly symmetrical as they are in the Anthropoid Apes.”⁵⁸

Dr Elliot Smith (1928) also reviewed the morphological features of the endocranial cast obtained from the Rhodesian skull (see Figure 2). There were indications “suggesting an open condition of the Sylvian fissure (S) — an approximation to the simian condition, that is also expressive of the poor development of the frontal (F) and temporal areas (T).”⁵⁹ Sir Grafton Elliot Smith found that “there are still territories in the upper parietal, prefrontal, and inferior temporal regions of the Rhodesian brain that are singularly ill-developed as compared with the corresponding parts of the brains of either the Neanderthal or the modern species of Man.” He also noted that the defective areas of the Rhodesian brain are those parts associated “in a general sense with the higher intellectual functions.” Professor Elliot Smith concluded that the “evidence afforded by the brain thus corroborates the inference drawn from the peculiarities of the face and the skull, that the Rhodesian Man conforms to a type definitely more primitive than that of the Neanderthal species.”⁶⁰

III

Carleton Coon (1962), Chester Chard (1969), and Francois Bordes (1968) all find that the Mousterian cultures of the European Neanderthals have roots in and can be derived from the advanced European Acheulian industries of the Eemian Interglacial and even the Rissian glaciation. Professor Coon also regards some of the European Early *sapiens* crania from the last interglacial period as morphologically related to the European Neanderthals of Würm I — in particular the Italian fossil finds from Saccopastore, Italy.

Two Early *sapiens* crania have been unearthed from a gravel pit at Saccopastore, just outside Rome. The first skull found was that of a 30-year-old female, with a cranial capacity of 1200 c.c., found in 1929 by Sergio Sergi. The second was that of a 35-year-old male, with a cranial capacity of 1300 c.c., found in 1936 by Dr A. C. Blanc. According to Carleton Coon (1962), Professor Sergi’s study of the Saccopastore brain cast demonstrated that “No. 2 was fully *sapiens*.” Sergi found that the Saccopastore “frontal and temporal lobes were similar to those of modern men, and that the impression of the cerebellum in

⁵⁸ Sir Grafton Elliot Smith, *op. cit.*, pp. 182-184.

⁵⁹ Sir Grafton Elliot Smith, *op. cit.*, pp. 165-166.

⁶⁰ Sir Grafton Elliot Smith, *op. cit.*, pp. 126-127.

the basal part of the occipital bone are also completely modern in depth and form.”⁶¹

Dr Coon contends that the skulls from the Saccopastore pit, which were associated with a simple, unmixed Mousterian culture, “anticipate the Neanderthals morphologically.”⁶² Both the Saccopastore and the Neanderthal crania “are globular in the rear; broad, low, widely curved outward over the earholes; and overhanging the area of neck-muscle attachment behind.” According to Coon, the *erectus* skulls of *Pithecanthropus*, *Sinanthropus*, Solo Man, and Rhodesian Man, when viewed from the rear, “are pentagonal in form.” In contrast, the Saccopastore and European Neanderthal skulls “are not pentagonal but circular, flattened at the bases.”⁶³ Furthermore, the configuration of the eye-nose triangle of the two Saccopastore crania “is Caucasoid, like that of Steinheim.”⁶⁴

In Europe the Göttweig Interstadial (Würm I-II) is estimated on the basis of radiocarbon dating to have lasted from about B.C. 40,000 to B.C. 29,000. This was a period of mild climate like that of the present. At the end of this period a 2000-year period of intense cold began, which was termed Würm II by Movius. This was followed by a long interval of generally cold conditions lasting some 17,000 years, and termed Würm II by Movius.⁶⁵

Carleton Coon (1962) finds that the Göttweig Interstadial “was a time of important racial and cultural change.” During this time period “the Neanderthals were replaced by Upper Palaeolithic people similar to modern Europeans.” The Mousterian flake culture “was succeeded by a blade culture that endured, in many forms and under many names, to the end of the Pleistocene, around B.C. 8000.”⁶⁶

Coon further contends that “the only part of the Old World in which a blade culture is known to have arisen from a flake culture in Würm I is the Near East — Palestine, Syria, Lebanon, and possibly western Iran.” He also finds that between the Würm I Palestinians of Mount Carmel and Skhul and the Russian Neanderthal from Starosel’e, “there is a perfectly valid transition from earlier Caucasoid people to Upper Palaeolithic Europeans.” Consequently, Coon concludes that the Upper Palaeolithic culture and its “accompanying racial type were

⁶¹ Carleton S. Coon, *The Origin of Races*, *op. cit.*, pp. 500-504.

⁶² Carleton S. Coon, *op. cit.*, p. 522.

⁶³ Carleton S. Coon, *op. cit.*, pp. 529-530.

⁶⁴ Carleton S. Coon, *op. cit.*, p. 504.

⁶⁵ Hallam Movius, “Radiocarbon Dates and Upper Palaeolithic Archaeology,” *Current Anthropology*, Vol. 1, No. 5-6, 1960, pp. 355-391.

⁶⁶ Carleton S. Coon, *The Origin of Races*, *op. cit.*, p. 577.

imported into Europe and could have come only from the East.”⁶⁷

The French prehistorian Francois Bordes (1968), however, sees a relatively gradual transition in Europe from essentially Mousterian industries to essentially Upper Palaeolithic industries marked by a gradual change in the number and variety of tools made on blades. He believes that “there must have been many points of transition, and many and varying origins” of the Upper Palaeolithic cultures. This diversity of origins would preclude the idea that the transition from Mousterian to Upper Palaeolithic “occurred in just one place from which the Upper Palaeolithic then spread abroad.” For western Europe, Professor Bordes finds that there is no difficulty in tracing back the origin of the Upper Palaeolithic Perigordian culture “to the Mousterian of the Acheulean tradition.”⁶⁸

The relation between the Würm I Neanderthal populations and cultures of Europe and South-western Asia and the successor Würm II Upper Palaeolithic populations of these regions has recently been investigated in great detail by Brose and Wolpoff (1971). These two investigators similarly find that wherever continuous archaeological sequences spanning the Götweig Interstadial are clear, “there seems to be no overlap or obviously rapid replacement, but rather a gradual transition from late Middle Palaeolithic to early Upper Palaeolithic industries.” Brose and Wolpoff find that “most of the tool types which are considered characteristic of the Upper Palaeolithic are present (albeit in lower frequencies) in late Middle Palaeolithic assemblages.”⁶⁹

Drs Brose and Wolpoff list some 70 tool types generally considered characteristic of Upper Palaeolithic cultures which have been found extensively and repeatedly in Middle Palaeolithic contexts in Europe, North Africa, and South-western Asia. These include blades, scrapers, graters, borers, tanged points, *et al.* Bone tools also “occur with some consistency at numerous Mousterian sites.”⁷⁰ Similarly, Dr Karol Valoch finds that in Central and Eastern Europe, most of the tools characteristic of the Upper Palaeolithic are clearly present in lower frequencies in the Middle Palaeolithic.⁷¹

Brose and Wolpoff also attempted to determine the absolute

⁶⁷ Carleton S. Coon, *op. cit.*, pp. 575 and 578.

⁶⁸ Francois Bordes, *The Old Stone Age*, McGraw-Hill, New York, 1968, p. 220.

⁶⁹ David Brose and Milford H. Wolpoff. “Early Upper Palaeolithic Man and Late Middle Palaeolithic Tools.” *American Anthropologist*, Vol. 73, No. 5, 1971, p. 1158.

⁷⁰ *Ibid.*

⁷¹ K. Valoch, “Evolution of the Palaeolithic in Central and Eastern Europe,” *Current Anthropology*, Vol. 9, 1968, pp. 351-390.

dates, using radiocarbon dating, of the youngest clearly defined Neanderthals and the oldest clearly defined anatomically modern *Homo sapiens*. They find "the youngest dates directly associated with Neanderthals come from three sources": Haua Fteah Layer XXXIII in Libya, dated at $40,000 \pm 500$ B.P.; Tabun Layer C in Palestine, dated at $40,900 \pm 1,000$ B.P. and Tabun Layer B, dated at $39,700 \pm 800$ B.P. The earliest dated specimens of anatomically modern *Homo sapiens* come from two sites in Czechoslovakia: Dolni Vestonice ($25,820 \pm 180$ B.P.) and Pavlov ($26,620 \pm 260$).⁷²

On the basis of these dates, there is a gap of some 14,000 years between the youngest Neanderthal and the oldest anatomically modern *Homo sapiens* specimens. Drs Brose and Wolpoff⁷³ point out that: "In no instance do either relative stratigraphies or absolute dates indicate anatomically modern *Homo sapiens* contemporary with or preceding Neanderthals in any area as would have to be the case if the former evolved somewhere separately and then 'suddenly replaced' Neanderthals all over the world."

Brose and Wolpoff believe that the morphological evidence also "indicates the continuity between Neanderthals and anatomically modern *Homo sapiens*." This includes the "classic" Neanderthals of Western Europe. The authors find that "where appropriate archaeological associations exist, unquestionable transitional populations are clearly associated with Middle Palaeolithic industries in Eastern and Western Europe, Africa, and the Near East." Furthermore, "the evolution of anatomically modern *Homo sapiens* clearly precedes that of Upper Palaeolithic industries." Consequently, Brose and Wolpoff conclude that both the archaeological and morphological evidence indicate "the *in situ* evolution of anatomically modern *Homo sapiens* from Neanderthal populations associated with Middle Palaeolithic industries."⁷⁴

Finally, Drs Brose and Wolpoff propose an adaptive model to explain "the selective factors leading to the evolution of anatomically modern populations." They note the general increase in the number of different types of tools during the Middle Palaeolithic period. The change from general to specific tools would have affected "the use of the jaws as a vice." That is, the development of special purpose tools would have reduced "selection for both *force* and *power* (force over time) in the

⁷² David Brose and Milford H. Wolpoff, *op. cit.*, p. 1157.

⁷³ David Brose and Milford H. Wolpoff, *op. cit.*, p. 1158.

⁷⁴ David Brose and Milford H. Wolpoff, *op. cit.*, pp. 1167 and 1184.

anterior dentition through a combination of less strenuous use and use over shorter periods of time.”⁷⁵

The reduction of selection acting to maintain a large anterior dentition would have resulted in “a concomitant reduction of robustness and size of Neanderthal anterior teeth, and ultimately of the supporting facial morphology.” Hence, the loss of the distinctive Neanderthal cranial form would be a “direct consequence of selection relaxation for the anterior dentition and supporting facial architecture.” The succeeding cold-adapted Upper Palaeolithic would not have developed mid-facial prognathism “due to the raised position of the calvarium relative to the nasal passages.”⁷⁶

Both the biological and the cultural evidence favor Hrdlicka’s view of a Neanderthal phase of evolution. That is, the European Neanderthals of the Würm I glaciation can be derived from the advanced European Early *sapiens* populations of the preceding interglacial period. Furthermore, there appears to be a biological and cultural continuity between the Würm I Neanderthals of Europe and South-western Asia and the succeeding Würm II Upper Palaeolithic populations of these regions. Hence, some or most of the Neanderthal populations of Europe and the Near East gave rise to the anatomically modern *Homo sapiens* populations of this part of the world.

IV

In summary, from the mid-nineteenth to the early twentieth century hominid fossils with large brains, but a number of distinctive morphological traits, had been uncovered from a number of sites in Western and Central Europe. These fossils, which dated from a time of extreme cold and were frequently found in caves or rock-shelters, were designated as *Homo neanderthalensis* or Neanderthal Man. The culture associated with the Neanderthal cranial and skeletal remains was termed Mousterian. The Mousterian culture, which had many variations, comprised flake tools, extensive use of fire, and limited use of bone.

The distinctive morphological traits of these West European or “classic” Neanderthals (*i.e.*, La Chapelle, La Ferrassie, Neanderthal, Le Moustier, La Quina, *et al.*) were described as: “massive brow ridges, retreating forehead, large projecting jaws, absence of a chin eminence, and certain peculiarities of the occipital region and base of the skull.” Early anthropologists and palaeonto-

⁷⁵ David Brose and Milford H. Wolpoff, *op. cit.*, pp. 1184-1185.

⁷⁶ David Brose and Milford H. Wolpoff, *op. cit.*, pp. 1185-1186.

logists emphasized the “primitive” characteristics of the Neanderthals and concluded that they formed a side evolutionary line which was not ancestral to modern man. The Neanderthals were supposedly “suddenly” replaced some 30,000 years ago by the anatomically modern European Upper Palaeolithic peoples possessing the highly advanced Aurignacian culture.

This early view of the taxonomic status of the Neanderthals has been greatly modified by information obtained from additional Neanderthal finds from different parts of Europe and adjacent regions, improved methods of dating, and statistical analyses of Neanderthal skeletal and cultural remains. During the past 40 years Neanderthal cranial and skeletal remains have been uncovered in East Europe and European Russia, Soviet Central Asia, North Africa and South-western Asia. Many of these regions lacked the extreme cold of Western Europe during the fourth or Würm glaciation.

Statistical analyses of the Neanderthal cranial and skeletal remains have demonstrated a high degree of variability among the Neanderthals — even in samples from a single site. One such study showed that among the few physical features distinguishing the group means of Neanderthal and anatomically modern *Homo sapiens* populations are a tendency for heavier bunning in the occipital region and more extensive mid-facial prognathism in the western European Neanderthals. In almost every other morphological and metric feature, there was a high degree of overlap between Neanderthal and anatomically modern *Homo sapiens* populations.

Carleton Coon contends that many of the “characteristic” features of the jaws and cranium of the western Neanderthals are special adaptations towards the bitter cold of western Europe in which the Neanderthals lived. Neanderthal finds from Russia and the Near East generally show closer affinities to modern Caucasoids than the “specialized” western Neanderthals. Both Coon and Ernst Mayr consider the European Neanderthals to be fully *sapiens*, on the basis of their high cranial capacity as well as details of cranial form. Dr Coon also regards the Neanderthal evolutionary line as “patently Caucasoid.” with the features differentiating Neanderthals from other Caucasoids being “mostly if not entirely due to local inbreeding and adaptation to cold.”

The Neanderthal phase of evolution spans the time period from approximately 100,000 to 40,000 B.P. In Europe this was the time of the Würm I glacial period. The Mousterian cultures of the European Neanderthals developed out of the advanced European Acheulian cultures, which date back to the Eemian interglacial and the previous Rissian glacial period. During the Neanderthal period, tool kits in Europe become more elaborate

and specialized, with primary emphasis on manufacture of flaked tools from prepared cores. Prehistorians now note a continuity between the Mousterian cultures of the European Neanderthals and the Aurignacian cultures of their Upper Palaeolithic successors.

During the Neanderthal phase of evolution, Europe and Western Asia continue to remain the center of cultural and technical progress. The European Neanderthals possessed the ability to live on the plains and hunt large game during a time of extreme cold. This implied the construction of artificial shelters and the use of clothing. Hearths are found in great numbers in Mousterian sites, indicating the regular use of fire. It is also among the European Neanderthals that we find the first conscious burials and the oldest known beginnings of magic and religion.

It is among the European or "classic" Neanderthals that we find the final expansion of the hominid brain to modern size. Carleton Coon lists the mean cranial capacity of nine male Neanderthals at 1552 c.c. and the mean of four female Neanderthals as 1337 c.c. This is some 3 to 5 per cent larger than the measured capacity of living Europeans. This expansion of the Neanderthal brain was undoubtedly a result of the intensification of selective pressures during the extreme cold of the Würm glaciation.

Comparative endocranial studies have demonstrated that the brains of the European or "classic" Neanderthals more closely resemble those of modern *Homo sapiens* than those of earlier *erectus* fossils (*i.e.*, *Pithecanthropus*, *Sinanthropus*) in shape and structure, as well as size.

Outside Europe the pace of biological and cultural evolution proceeded at a much slower rate. Isolated by climatic barriers, sub-Saharan Africa, India, and South-east Asia remain areas of technological conservatism. Fossil finds from these regions (*i.e.*, Solo Man, Rhodesian Man, Saldanha) have lower cranial capacities than their European contemporaries. Endocasts of the Rhodesian skull reveal a brain much more primitive in structure.

Neither relative stratigraphies nor absolute dating indicate any evidence of anatomically modern *Homo sapiens* contemporary with or preceding Neanderthal man in any area of Europe, North Africa, or South-western Asia. Indeed there appears to be a 14,000-year gap between the youngest Neanderthal and the oldest known anatomically modern *Homo sapiens*. Both the cultural and the biological evidence favor Hrdlicka's view of a "Neanderthal phase of evolution." That is, some or most of the Neanderthal populations of Europe and the Near East gave rise to the succeeding Upper Palaeolithic peoples of these regions.

The Anthropological Study of Finland

By BERTIL LUNDMAN*

In 1957 the Finnish Academy of Science published the last provincial monograph of the national anthropological research project carried out by that body since 1924. It seems, therefore, appropriate to review the results thus far obtained in the anthropological study of that country. Of the approximately four million inhabitants of Finland some nine-tenths now speak Finnish and one-tenth Swedish. There are also several thousand Lapps and Russians. However, the Finnish Lapps, about whom I have written several times in connection with the rest of the Lapps, will not be considered in this article.

I

The prehistory of Finland has been studied with remarkable success (*Swedish Compendium*, by C. F. Meinander, 1952). These explorations have, unfortunately, yielded practically no human remains. The only ones of any importance are those from the moors near the west coast in the province of South Ostrobothnia. They are the remains of somewhat more than a dozen individuals and date from approximately 800 A.D. These remains are from males of very short stature, on the average scarcely 5 feet 3 inches (160 cm.) tall, and of graceful build. The skulls are dolichocephalic (on the average hardly 74 for the males), with a length-height index of about 71.5. Presumably these are remains of decadent northern types — criminals or slave weaklings who were of almost no value to their owner and were therefore used as sacrifices (Pesonen, 1940, and Blomquist, 1953). This meager find does not, of course, contribute much to racial history. We are, therefore, obliged to go back to the ethnogeny of the various tribes, as it is known from the history of culture and settlement.

Most of the modern prehistorians assume that the ancestors of the present-day West Finns began to arrive on the southwest coast of Finland around the time of the birth of Christ. However, the ancestors of the East Finns are believed to have settled in the eastern part of the country as early as the Stone Age, and at that time with a more or less comb-ware culture (*Kammkeramischer Kultur*). This difference showed itself at the dawn of

* Translated from the German by George H. Classen.

history, around 1200 A.D., in a rather sharp contrast between the west, or "true," Finns (Suomi) and the Tavasts, on the one hand, and the eastern tribes of the Karelians and Savolaxians on the other. (Northern Finland was actually settled permanently by the Finns only in the Middle Ages. The settlers were the so-called Kvaens, a tribal mixture predominantly of East Finns with a minority of West Finns). This distinction between west and east in Finland is thus much older than the Late Medieval boundary, which happened to run farther eastward. Until the Peace of Teusina in 1595 this border separated the Swedish and the Russian spheres of influence. Even in our own days the line of separation is still quite noticeable as regards anthropology, ethnology and dialect.

The antiquity of the present Swedish population in Finland, however, is a matter of much controversy. Only a few historico-cultural indices (such as place-names) point to uninterrupted settlement since pre-Christian times. Furthermore, this is true only of the southwest, notably the offshore islands and probably also some adjacent coastal areas. The rest of the Swedish settlements probably came into being only after the Swedish conquest around 1150 A.D. This is clearly demonstrated by the still thickly settled Swedish area along the western portion of the south coast. This stretch was first colonized before about 1300 A.D. by settlers from east-central Sweden, which agrees well with anthropological findings (see below).

Finally, the Lapps continued to roam about the whole country as long as the Late Middle Ages, even reaching as far as the south coast. But they are now confined entirely to the northernmost parts of the country and number no more than 2000.

Settlement patterns solidified during the Late Middle Ages. From that period on the Swedish population is to be found in three main areas of the southwest: on the Åland Island (and most of the islands between the Ålands and the southwest coast), and along the two lengthy stretches of coastline, one of them being the central and western portions of the south coast, the other the central portion of the west coast around the (admittedly rather wide) narrows called Kvarken between the southern and northern parts of the Gulf of Bothnia. A few smaller portions of these two coastal areas are now populated entirely by Finns. Otherwise the Swedes continue to predominate, since the devastating old Russian wars (up to 1809) caused only local population shifts.

II

The history of the anthropological study of Finland begins in the year 1843 with a lecture before the Finnish Academy of

Science by the physician K. A. Haartman on the anthropological tribal types of Finland. It was the same year that Anders Retzius gave his fundamental lecture on the cranial shape of the Northern people before the Swedish Academy of Science. (There is obviously a direct historical connection with Haartman's lecture; however, nothing further is known about it.) Beginning with the then very eagerly pursued study of Finnish tribes (we must remember that this was the age of awakening nationalism), Dr Haartman sketches a very simple picture of the Finns. However, Haartman likens the Karelians to "desert Bedouins" (!), with brown hair, blue eyes (!), long and high-vaulted crania, narrow faces, and straight, narrow noses. The Tavasts were completely blond, with turned-up noses, broad and low-vaulted crania, and also a shorter and broader build than the Karelians. The Savolaxians were viewed as a mixed race of Karelians and Tavasts. Although this assumption was wrong, it continued to serve as a basis for Finnish tribal typology until the end of the nineteenth century. It was even elevated to a sort of canon in the works of Gustaf Retzius (son of A. Retzius) following his travels in Finland in the 1870s.

Proper scientific anthropology began only with the Medical Councillor, Dr F. W. Westerlund, who personally examined 5661 young Finnish soldiers in 1898-99. Published data for the whole country, however, were limited to the cephalic index and pigmentation. In order to collect more material on stature, Westerlund studied the mustering rolls for eight draft years (1885-92) — altogether no fewer than 131,700 men. Containing information from every parish in Finland, the work was published in 1900, with the anthropometric data arranged according to the 70 recruiting districts. This study showed that the West Finns were much taller than the East Finns, and also somewhat less brachycephalic. Both groups were very light in pigmentation, with the eastern group being just a shade darker.

Then followed for Finland the eventful decades of 1900-1920, during which there could naturally be little anthropological research. But by 1923, shortly after the return of more peaceful conditions, the young and active professor of anatomy, Y. Kajava, president of the Academy of Science (who, unfortunately, died a premature death in 1929), initiated a comprehensive investigation of adults of both sexes (men aged 25-49, women aged 20-49) and of all tribes of the country. For the purpose of the investigation, Finland was divided into about 50 districts according to the history of settlement. An attempt was made to obtain as much data as possible from natives of each district, according to a rather elaborate system embracing a minimum of 26 body and 19 head and face measurements, as well as hair color and eye color (but without color charts), and often also considerable morphological

data. At least nine indices were calculated, and usually many more. For example, 23 indices were calculated for the southernmost province of Finland (Nyland). Following this, a detailed monograph was prepared and printed for each of the eight (with Lapland, nine) provinces of the country, at the expense of the Finnish Academy of Science. The monographs contained an introduction on the history of settlement, and a comprehensive presentation of the material collected, but almost no conclusions, maps, or pictures (these were supposed to be presented in a final volume, which has not yet appeared). The material was collected chiefly in the years 1924-30 (some of it, however, much later). The first provincial monograph appeared in 1931 and the last in 1957. Naturally, the work was again delayed by the new period of difficult times for Finland.

It is an imposing series of volumes with a total of 1155 pages (plus 200 pages on Lapland); 1015 tables (plus 74), most of them large; and many diagrams, *etc.* This work led an outstanding non-Scandinavian anthropologist to describe Finland as perhaps the best-studied nation.

On closer look, however, it becomes apparent that the project was much too ambitious for Finland's still under-developed anthropological research. The investigators, often young medical men, frequently lacked the necessary training. In addition, the large number of measurements and other data that had to be collected usually compelled extreme limitation in the number of subjects. Also, investigator and publisher were frequently different persons. Thus the total number of subjects adds up to only 8518: 6724 Finns and 1794 Swedes. (There were 3755 Finnish and 802 Swedish men; 2969 Finnish and 992 Swedish women.) In addition, the investigators examined 664 Lapps (not discussed here) of whom more than half were children. The distribution of the areas investigated was very uneven, so that more accurate maps could not be produced from the data. On a provincial basis, however, the figures are acceptable after weighting.

III

Here we shall discuss only those measurements and indices* which appear to me trustworthy. Unfortunately, the data on pigmentation are not reliable (see above), likewise the data on morphology. In addition, the latter data have been published for only a few provinces. I have confined myself almost entirely to the male material, with the female material being used only in a

* It is not possible, however, to deal individually with the absolute components of the indices, even though they were presumably arrived at in a correct manner.

few cases after conversion to male values. On the other hand, I have occasionally referred, by way of comparison or complementation, to Westerlund's material (designated as "W", the rest as "A"), and for the cephalic index a few times to Sievers (1927).

The average male stature for all Finland is given by Westerlund as 5 ft. 5 in. (167.0 cm.) and by the Finnish Academy as 5 ft. 5½ in. (169.1 cm.). The latter figure, however, was not obtained from subjects of the same age groups but from those born roughly between 1875 and 1910, a time during which there was a large increase in stature in Finland (B. Lundman, 1940). In spite of this, there is — not so much in the individual diagram for all Finns, as in diagrams of district means of both studies (W. and A.) prepared by the author — a very pronounced bimodal distribution with the national average exactly in between the two peaks. On the left is the peak representing the mean stature of the shorter East Finns and on the right that of the taller West Finns and Swedes. The two latter groups merge almost imperceptibly, even though the Swedes, on the average, are somewhat taller. The two peaks are particularly well defined in the older, more comprehensive study.

The two maps of stature show approximately the same values, even though that of 1890 with its 130,000 male subjects is probably more accurate as to details. There is a general decrease in height from southwest to northeast. At least as regards the older map this corresponds approximately to the cultural slope of that time, which could suggest an environmental influence. There is, however, a very noticeable jump along the boundary between the west and east Finns, running directly across the Lacustrine Shield (*i.e.*, the Finnish flat country covered with lakes) with its almost uniform economic conditions — obviously the result mainly of different tribal inheritance. We may also point to the — admittedly rather small — increase in stature along the Swedish boundary far up north.

Since the data on the cephalic index compiled by Westerlund and the Finnish Academy (as well as the few observations by Sievers) do not raise the slightest suspicion of diverging techniques, I have incorporated them into one map. This map shows in a striking manner the uniformity as well as the relatively low value of the index over the entire Shield. The even lower cephalic index in the southwest is of course due almost entirely to Swedish influence. Most of the persons examined still speak Swedish. The somewhat higher values in parts of southern Karelia are in good agreement with similar values in the adjoining areas of Russia and in eastern Estonia. The even higher index in the north appears to radiate from the very short-headed community of Kuusamo and

environs. This, however, is not certain, for the latter area is an exception. The entire northward increase in the index is most likely due to Lapp influence. Nevertheless, the population of the Kuusamo district is neither darker nor of lower stature than that of the surrounding area — rather the opposite. The high index in Kuusamo may therefore be due to an old highly inbred local type that need not have much Lapp admixture. The small dolichocephalic enclaves in southern Ostrobothnia and in southern Karelia, however, are probably to be explained by historically demonstrated migrations of settlers from the southwest.

The ear-length-height index of the head given in the study by the Finnish Academy is not comparable with the data from other countries, since the height of the head (following the proposal of Kajava) was taken to mean the perspective elevation between the planes of the tragus of the ear and the crown (bregma) of the head. The uniformity of the results, however, ought to convince any doubter that the purpose of the measurements was achieved easily and gracefully. (The method should therefore be tried elsewhere and it may well solve the current difficulties of measuring ear-height on living persons.) The map shows lower values along the western south coast (as well as in Lapland which is not considered here), and higher values partly in the southeast and partly in the north, just south of Finnish Lapland. This agrees with the data on the (basion-bregma) height-length index of the cranium from about a dozen cranial series reported in the anthropological literature.

The zygomatic arch is absolutely smaller in some narrower faced Swedish groups in the west and southwest and in the short East Finns. This, however, does not hold for the equally short North Finns mixed with the very broad-faced Lapps. These groups have an absolutely larger zygomatic arch, along with the medium-sized West Finns and the very tall island Swedes. The whole picture is thus far from clear. The very small values along Lake Ladoga are physiognomically noticeable, thus providing the only definite basis for Haartman's "Bedouin hypothesis." This trait may hark back to old remnants of East-Mediterranean Russian and Gypsy immigrants, of whom there were at one time fairly large numbers in this area (see map in Thesleff, 1910).

IV

Let us, lastly, turn to a consideration of the blood-group data collected by the great serologist Oswald Streng (who later called himself Osmo Renkonen) and his school, above all Eero Mustakallio. Carried on very actively during the thirties, Finnish blood-group research declined in the postwar years and has only

recently started up again. Therefore, we cannot give much more than the geographical distribution of the ABO system — this, however, with a fairly high degree of accuracy. Only for North Finland do we, unfortunately lack almost all data.

Unique characteristics are exhibited above all by the population in the East Finnish portion of the Lacustrine Shield, with relatively little r , but on the other hand as much p as q . This is without any close similarity to the distribution in the surrounding areas. (It appears to resemble, most of all, the distribution among the low-vaulted Kola Lapps.) Along the south and west coast mean q values are almost everywhere lower than in the rest of the country, which is probably due to the modern Swedish and, farther eastward, to the ancient Swedish influence. The high q content in the interior of the southwest, similar to that of Estonia, agrees well with the general view of the prehistorians that the ancestors of the modern “true” Finns came from there around the beginning of the Christian era. As an ethnographical parallel we might mention that the use of draft oxen was common as late as the twentieth century both in Estonia and in the Finnish southwest, while it was lacking in the rest of Finland (Vielkuna, 1936). The few data for North Finland as well as the figures for the adjacent territory in Sweden (Beckman, 1957) show fairly low q values, caused perhaps by Scando-Lapp and — in the border area — by Swedish strains.

As far as pigmentation is concerned we can use only Westerlund's data, which show very light colors for almost the entire country. The north of Finland, however, is slightly darker (see above).

V

To summarize: The twofold anthropological division of the Finnish national territory (as it existed between the two world wars) is more or less clearly delineated on our maps. The newer and older Swedish strains give a somewhat special character to most of the coastal regions of West Finland. In north Finland (south of the area now populated by the Lapps) we find, apart from the Swedish strain along the border, a Scando-Lapp element with hypsicephalic crania and low q values. The modern Finnish Lapps indicate a locally variable mixture of chamaecephalic and higher- q value East Lapps, which we cannot explore further here. The fluctuating history of South Karelia is reflected anthropologically in the checkered racial geography, a fact indicated by several observations in this article.

We must further emphasize that the pronounced chamaecephaly of the inhabitants of the western south coast, as well as their somewhat lower stature, is probably due to the migration

of east-central Swedes in the fourteenth century. In contrast to these migrants, the Swedes in East Bothnia appear to have mixed more thoroughly with the Finns, a view that has geographical and historical support. The island Swedes resemble the population of southern Norrland in Sweden in their tall stature, but their cranial height is much greater and similar to that of the Finns. Possibly their basic stock is very old and the result of an ancient and unique mixture of a large number of Swedes and a small number of Finns, a hypothesis that can be fitted into the history of settlement. From the anthropological viewpoint the difference between the Swedes and West Finns seems to be generally less than that between the West Finns and East Finns, even though the Finnish Swedes on the whole are clearly distinct from the West Finns. Biogeographically speaking they inhabit that part of the west Finnish area which is facing towards Sweden. In the interior regions of Finland, however, we find fewer and fewer quasi-Swedish "clines" (in Julian Huxley's sense).

This would seem to sum up the most important data from published sources. I have therefore avoided all racial labels and have referred almost exclusively to population and ethnic groups. Much more, of course, could be said if we really knew the racial geography of Finland, both as regards the always important morphological as well as the physiological aspect, as for example in respect of the other blood-group systems. Here almost everything still remains to be done, despite a good deal of diligent labor: and it ought to be done before the picture is obscured by increased inner migrations.

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The Origin of the Zimbabwean Civilisation

By R. GAYRE OF GAYRE

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Red Indians and Religion

By R. QUINN DUFFY

The Great Plains comprise a vast shimmering area of low relief and wide horizons, the dry and almost treeless heartland of the North American continent. From the foothills of the Rockies eastwards the grasslands roll some seven hundred miles towards the Mississippi and the Great Lakes. They stretch out like a slumbering giant, with blond head in southern Canada and tawny, sun-tanned toes within a few hundred miles of the warm Gulf of Mexico. Altogether they touch or completely cover ten states, a fifth of the area of the American nation, and five and a half million North Americans swarm all over them like Lilliputians on the pegged-down Gulliver. At least that is how many there were in 1950. How many Indians there were in 1750 or 1850 is anybody's guess. About 109,000 is suggested for 1780; that is, before European influence on the Plains had been profoundly felt. By 1851 it is reckoned there were as many as 250,000 or even 300,000.

That Indians have inhabited the Plains for thousands of years is now accepted. Until quite recently, however, it was believed that the western Plains were a "prehistoric uninhabited region" only "nibbled at" here and there by hunting groups from the mountains to the west or by more venturesome semi-agricultural peoples from the river valleys to the east. Since the beginning of systematic archaeological work over the last four decades, these older views are no longer tenable. Though they lacked the large village sites of the middle Missouri or the burial mounds found further east, the western Plains nevertheless contained ample evidence of long occupation by man, an occupation that began with the early big-game hunters of as long ago as 10,000 years.

In summer the Great Plains bask under white-hot skies and a broiling sun. Temperatures can exceed 110 degrees Fahrenheit, but there are frequent strong cooling winds, occasional thunder storms, and pelting showers of hail. Normally the summer temperature ranges more comfortably from 60 degrees to 80 degrees. It never gets very wet. Precipitation is scanty, with just over 15 inches in the north, higher in the isolated hills, and as little as six inches in the Big Horn valley. Most of it falls in early summer to the benefit and joy of the parched and thirty grama and buffalo grasses and sagebrush which are just then beginning their comparatively short growing season. In winter, under a thick dazzling blanket of snow, which lies for as many as 120 days in the north, the average temperature increases southwards from

five degrees to more than 20 degrees Fahrenheit, but sub-zero temperatures occur everywhere and at Poplar, in northern Montana, the record low stands at 63 degrees below Fahrenheit. The cold of winter is tempered in the west by the warm chinook winds that flow across the Rockies, raising the mercury by as much as 40 degrees in an hour. These are similar to the Föhn winds of the European Alps.

The most distinctive feature of the Plains climate is its variability. Averages mean little where the rainfall can be less than 10 inches in one year and 30 inches the next, and where the temperature can drop 60 degrees in a few hours or rise 40 degrees in one. "If the variations were predictable," writes C. F. Kraenzel¹ "adjustments in the way of living might be made. The added fact of unpredictability increases the climatic hazard significantly."

This was the hazard that the Indians faced and learned to live with, as did the animals of the Plains in which he lived: the pronghorn, the jack rabbit, the prairie dog, the wolf, the coyote, the beaver, the bear and, more important than all of these, the animal that symbolises the Plains environment, the buffalo. The way in which the Indian of the Plains faced the hazard of climatic fickleness and learned to live with it, the way in which he perceived his world of undulating grassland, boundless horizons and vast doming skies and wrested a living from it, is the essence of his religion. Religion in this context is not to be thought of in the sophisticated terms of Church, creed and moral codes, but in the primitive sense that Malinowski describes as the ways men have of making the world acceptable, manageable and right. In this sense all religions are primitive religions, for this in fact is what all religions are for—even the highest.

The Indian has been described as having the mind and feelings of a child with the stature of a man. To the young child, with its innocent clear-eyed vision of the world, everything visible is alive and has a purpose. This is the animist conception, and to a mind inclined towards animism no direct experience can prove that the sun and the clouds are neither alive nor conscious. This does not mean that the animist imparts human characteristics to an inanimate world; he does not *know* an inanimate world. As Henri Frankfort² wrote in *Before Philosophy*:

The world appears to primitive man neither inanimate nor empty but redundant with life; and life has individuality,

¹ C. F. Kraenzel, *The Great Plains in Transition*, University of Oklahoma Press, Norman. 1955, p. 17.

² Henri Frankfort, *Before Philosophy*, Penguin Books, Harmondsworth, 1946, p. 14.

in man and beast and plant, and in every phenomenon which confronts man — the thunderclap, the sudden shadow, the eerie and unknown clearing in the wood, the stone which suddenly hurts him when he stumbles while on a hunting trip.

In *The Indians of Canada* Diamond Jenness³ wrote that the Indian

interpreted the phenomena of nature in spiritual terms, projecting his own mentality into the processes he saw at work around him. Spiritual forces akin to those in his own being caused the sun to rise and set, the storms to gather in the sky, the cataract to leap among the rocks, and the trees to bud in springtime. A mentality similar in kind to his animated the bird, the animal and the fish. The same reason, the same emotions that actuated all his movements, actuated also all that moved on earth, in water and in sky.

The mysterious forces of nature that breathed life into all created things was known to the Crow Indians as *maxpé*, to the Hidatsa as *xupa*, to the Algonkian as *manito*, and to the Dakota as *wakan*. To the Dakota, as Malinowski⁴ has pointed out:

all life is *wakan*. So also is everything that exhibits power, whether in action, as the winds and drifting clouds, or in passive endurance, as the boulder by the wayside. . . . Of the *orenda*, a word taken from the Iroquois, we are told: "This potency is held to be the property of all things . . . the rocks, the waters, the tides, the plants and the trees, the animals and man, the wind and the storms, the clouds and the thunders and the lightnings. . . . By the inchoate mentality of man it is regarded as the efficient cause of all phenomena, all the activities of his environment."

This mystical awareness of a cosmic creative force that imbues the whole of nature and binds it into an indivisible unity is universal. It is known as *mana* by the Melanesians and *arung-quiltha* by certain Australian Aboriginal tribes. To the Chinese followers of Laotse, both ancient and modern, it is the *Tao*, "the mysterious secret of the universe," described by Laotse's brilliant disciple, Chuangtse, as "the intrinsic principle in created things which is not expressed. . . . The spirit of the universe is subtle and informs all life."

³ Diamond Jenness, "The Indians of Canada," *National Museum of Canada Bulletin*, Vol. 65, 1963, p. 168.

⁴ B. Malinowski, *Magic, Science and Religion*, Doubleday, New York, 1954, p. 77.

This spirit of the universe when it appears as the Creator in Plains Indian mythology takes no fixed form, as might be expected from the imagination of a people who made no clear spiritual distinction between animate and inanimate. In its most abstract non-corporeal form it is *Wakan tanka* and it is characteristic that both of these words are adjectives. The first means something like "mysterious" or "awe-inspiring," the second "great." In English they are usually mistranslated as Great Spirit. In increasingly more anthropomorphic terms the Great Spirit becomes *Father Heaven*, then *Old Man*, and then shades into the theriomorphic through *Old Man Coyote* to simply *Coyote*.

Old Man was known to the Indians as *Na'pi*, a word compounded of *Ni'nah*, meaning "man," and the particle *a'pi* which expresses colour. It implies the idea of whiteness, hence its use as a suffix for "old" in personal nouns; but really it describes the tint seen in the early morning light, in the brightness of the dawn, not a pure white, but one tinged with the faint pearly cast of gold. *Na'pi* would seem to mean "Dawn-light-colour-man." This is the light that comes before the sun, that brings forth the sun, creates it, so to speak. Creates the sun and the morning star too. In the light of dawn the features of the world emerge out of the dark shades of night, the animals are wakened and man begins his daily tasks. The dawn thus has powerful emotive association in the mind of the Plains Indian, as a bright prairie dawn still has for most men even yet. The Indian pitched his tipi so that the door faced east or north-east, and tribal camp circles were arranged in the form of a C with the opening towards the dawn, the source of light, life and understanding. Only when the camp was pitched preparatory to a war-party or to any undertaking that entailed human death was the circle of tents open to the west, the sunset domain of the dead.

In his observation and perception of his environment lie the seeds of the Plains Indian's religious thought. *Na'pi* is the light of dawn that calls forth the morning star and the sun and brings the earth into visible being. *Na'pi* is the Creator, the Great Spirit, the Father and Grandfather of the Universe. This can be rationalised in terms of modern physics in that it is the reflection of light by objects that reveals the whole world, the whole universe, to the senses, and of biology in that it is the absorption of sunlight in the process of photo-synthesis that is the basis of all life on earth.

The sun and the morning star become "gods," though the word implies more than is intended, the morning star being the equal of and often superior to the sun. Only among the Dakota was the sun regarded as supreme. Distinctions such as these, however, are creations of the modern sophisticated mind, forever separating,

ordering, classifying. Father, Son and Holy Ghost merge into the unity of the one and indivisible God, the Great Spirit of the Christians. So to the primitive mind *Na'pi*, light, morning star and sun were interchangeable, merging into the one unifying universal force or power *wakanda*.

Sophisticated western man has lost touch with this unifying universal force. There is much to suggest, writes Alan Watts⁵, that when human beings acquired the powers of conscious attention and rational thought "our total sensitivity became identified with these partial functions so that we lost the ability to feel nature from the inside, and, more, to feel the seamless unity of ourselves and the world." Freud made somewhat the same point in *Civilisation and its Discontents*⁶ "The ego feeling we are aware of now is thus only a shrunken vestige of a far more extensive feeling—a feeling which embraced the universe and expressed an inseparable connection of the ego with the external world."

There is reason to believe that the Plains Indian, despite his instinctive awareness of the unity of the universe around him, or maybe because of it, felt himself alienated by his own awareness from the source of the supernatural power responsible for that unity and, like the Chinese Taoists and Zen Buddhists, sought through religious practices a means of re-establishing his personal link with the infinite.

The Indians of the Great Plains pinned little hope on an uncertain hereafter. Instead they

sought from religion help and guidance in this present life alone, and with full consciousness of the limitations in their own knowledge and power, they summoned to their aid the mysterious forces surrounding them in order to obtain during their mortal span all the blessings that their hearts desired.⁷

Of more than 30 tribes on the Great Plains the outstanding feature of religious behaviour consisted of attempts to gain hallucinatory visions or revelations which were the conventional means of gaining supernatural power from the world around them. Ruth Benedict⁸ writes of an "inordinate pursuit of the vision" and describes recognition of the vision as "the fundamental and typical religious fact of North America." In his book

⁵ Alan Watts, *Nature, Man and Woman*, Vintage Books, New York, 1958, p. 7.

⁶ Sigmund Freud, *Civilisation and its Discontents*, Hogarth Press, London, 1949, p. 13.

⁷ Diamond Jenness, *op. cit.*, p. 167.

⁸ Ruth F. Benedict, "The Vision in Plains Culture," *American Anthropology*, Vol. 24, 1922, p. 8.

on *Religion in Primitive Society* Norbeck declares the vision quest to be "the mainspring of Plains Indian religion."⁹

On the plateau to the west and in the woodlands to the east the vision quest was an affair of adolescence, a ritual on the threshold of maturity. On the Plains, however, though it was customary, if not obligatory, for adolescents to undertake the vision quest, it was continued through life for all kinds of recurring experiences: illness, bereavement, war-paths, revenge, child-naming.

Usually the Indian went off alone, naked or nearly so, with only a blanket for warmth at night, and in some lonely place he fasted and practised self-mutilation and torture. Among the White Knife Shoshone of Nevada certain areas—caves, mountain-passes, hidden valleys—were regarded as reservoirs for specific powers and to these places the Indian resorted to seek *buhu*, the super-human power which he believed to reside in various natural beings and objects.

Not all tribes practised self-torture but the majority of them did. The Cheyenne, the Blackfeet and the Dakota all used it, often to an inordinate degree. "Everywhere where we find torture," writes Ruth Benedict,¹⁰ "we find that the sun, for no apparent reason, is especially involved." Of the Dakota, who consistently placed the sun at the head of their "pantheon," this was particularly true. There is an origin tale among the Crow Indians in which the sun tells a man to cut off a piece of his flesh and give it to him, and it was common practice among vision-seeking Indians to cut circular disks of flesh from under the skin as an offering to the sun. Throughout the whole Plains area one of the most common sacrificial offerings was a finger-joint. So prevalent was this practice that in the Winnebago Indian language the etymology of the word for sacrifice means "to cut off a finger-joint." The missionary Father de Smet recorded of some tribes in 1852 that he could not find any old man who possessed his full number of fingers.

This practice of hacking off a finger-joint was so common as to be regarded as typical of the Plains. But this form of sacrifice has a world-wide distribution and a history almost as old as humanity. Among the subjects painted on the walls of French and Spanish caves of 20,000 or 30,000 years ago there are negative silhouettes of human hands many of them with finger-joints missing. Finger sacrifice has been recorded among many tribes in Australia, New Guinea, Fiji, the Tonga islands, Nicobar islands,

⁹ E. Norbeck, *Religion in Primitive Society*, Harper and Row, New York, 1961, p. 154.

¹⁰ Ruth F. Benedict, *op. cit.*, p. 9.

India, isolated parts of Africa, Paraguay, and Brazil but most particularly among the Plains Indians of North America and extending as far as the tribes of the north-west coast and California.

As well as in the vision quest the Blackfeet sacrificed finger-joints also as a sign of grief in mourning, in much the same way as Buddha, when leaving his faithful wife, made the sacrificial gesture of cutting off his long aristocratic locks. This might have been a Crow characteristic also. In their mythology there is a story of a man who, when he hears that his girl-friend has been captured by the enemy, chops off a forefinger and goes to the mountains for a long time. Later he leads a war-party to recapture her. It has been suggested that the sacrifice was made in mourning for the lost girl-friend, but it could just as easily have been a supplication for aid from the vision spirits, especially as it was followed by a long sojourn in the mountains and then by the determined act of rescue.

In Europe a memory of the finger sacrifice appears to have lingered in the collective unconscious down to Classical times. In Pausanias's second-century A.D. *Description of Greece* we read that on the road from Megalopolis to Messene there¹¹

is a small mound of earth surmounted by a finger made of stone. Indeed the mound is named Finger's Tomb. They say that here Orestes, when he went out of his mind, bit off a finger of one of his hands. . . . Here, too, there is a sanctuary of the Eumenides. They say that when these goddesses were about to drive Orestes out of his wits they appeared to him black; but that when he had bitten off his finger, they seemed to him white, and his wits returned to him at the sight.

Fasting was used by many of the Great Plains tribes as a means towards a personal relationship with the supernatural. The object of the fast, together with self-torture and sacrificial offerings, appears to have been to elicit pity from the powers. Blumensohn¹² makes this point, saying that the Indians believed that by fasting, the suppliant underwent such suffering, made himself so weak, that the spirits were overcome with pity and so granted him whatever he desired. And Weston La Barre¹³ writes that the "psychic authority" of American Plains Indians in aboriginal times consisted in supernatural visions obtained through fasting and praying in which an animal or spirit "taking pity" on the suppliant's weakness and suffering vouchsafed supernatural power

¹¹ Vol. I, Bk. VIII 34: 2-4.

¹² J. Blumensohn, "The Fast Among North American Indians," *American Anthropology*, Vol. 35, 1933, p. 453.

¹³ Weston La Barre, *The Peyote Cult*, Yale University Publications in Anthropology, Vol. 19, 1938, p. 299.

to him. In the novels of Dostoievsky suffering meant pity and love. In the tragedies of ancient Greece suffering led to wisdom, and this has survived into modern Greek literature, for to Nikos Kazantzakis suffering means certitude in being chosen for salvation by the love of a compassionate and interested Creator.

Fasting and self-inflicted wounds were only two of the measures practised in the Plains Indian vision quest. To these can be added exposure to the elements, fixed staring at the sun, steam baths followed by plunges into cold water, sexual continence and solitude. The most extreme and violent measures were practised by the Indians of the Great Plains. Days of fasting, torture and intense wishfulness put the individual in a half-crazed state where he might easily experience hallucinatory visions.

Asceticism, of course, is not unique to the Indians of the Great Plains. It appears in almost every religion from the Hindu fakirs to the Moslem sufis and the monks and mystics of Christianity. To chasten the body and to love fasting were two of the monastic rules of St. Benedict. Though self-mortification was inflicted for the genuine religious purpose of acquiring merit, it was also a powerful device for altering the chemistry of the body in general and of the nervous system in particular. Similarly any long and intense concentration upon a single idea or image, like the Indian's fixed staring at the sun or other object, may also result, for neurological reasons, in a slowing down of respiration, even in prolonged suspension of breathing, which, as in the case of oriental yogis, leads to an increased concentration of carbon dioxide in the blood and consequently to a change in the quality of consciousness. Furthermore, experimental psychologists have shown that a person in a limited environment, like the Indian's lonely mountaintop or empty cave, soon undergoes a modification of his consciousness and may transcend his normal self to the point of hearing voices or seeing visions.

This was exactly what happened in the case of the Plains Indian. He heard voices and he saw visions. In these was his religion deeply rooted.

The visions recorded for the Plains Indian were as varied as his subconscious imagination would allow. Usually the vision took the form of an animal or bird that appeared to the suppliant and talked with him, passing on to him songs, mementoes, taboos. Among the Plains Crow the tutelaries were nearly always animals, though they often appeared in human form during the action of the vision. To the Indian they were unquestionably the means of obtaining supernatural power from the universal source. They were the Indian's link with the supernatural and their authority was absolute. This is part of the Judaeo-Christian tradition also. One is immediately reminded of the burning bush through which

God gave his stern commands to Moses in the desert, of the temptations that Christ suffered during his long fast in the wilderness, of that final vision that appeared during the vigil on Gethsemane, of St. Paul's conversion on the road to Damascus. In this context it is interesting to read Robert Bage's 1796 account of how his mother tried to convert the venerable Indian chief, Lontac, to the true faith. In the course of their discussions Lontac told her a tale in which a half man-half bear figure spoke to the Indians.

Bears speak! again exclaimed my mother.

A serpent, answered Lontac, spake to the first woman; an ass spake to a prophet; you have said so, and therefore I believe it.

But, said my mother, they were inspired.

So was the half white bear. The Great Spirit inspires everything.¹⁴

Ceremonial procedure was preeminently derived from the vision. As the Indian medicine-man, Black Elk, told J. G. Neihardt¹⁵: "A man who has obtained a vision is not able to use the power of it until after he has performed the vision on earth for the people to see." Thus arise mythologies and their associated rituals and dances, like the famous Sun Dance ceremonial of the Plains. Songs too were learned from visions. The Indian alone in some silent place, his mind passive, hopes for an impression to come to him from a mysterious source. The silence becomes vibrant, it becomes rhythmic and a melody comes to his mind. This is his "dream song," his most individual, most valuable possession.

... soft stillness and the night

Become the touches of sweet harmony.

The Yaqui Deer Dance in Arizona contains in one of its songs the line: "The bush is sitting under the tree and singing." "Singing," though correctly translated, refers to the emanations of supernatural power, the bush sharing in that power that pervades the whole universe and imparting it to the sensibility attuned to it. Note how even today we "tune in" to radio waves. One thinks of Pythagoras listening to the "music of the spheres" and recalls that it was upon the foundation of this Pythagorean fantasy that

¹⁴ *Pelican Book of English Prose*, Vol. IV, p. 153.

¹⁵ J. G. Neihardt, *Black Elk Speaks*, University of Nebraska Press, Lincoln, 1961, p. 87.

Kepler "built the solid edifice of modern astronomy," as Koestler¹⁶ shows in *The Sleepwalkers*.

One of the most interesting facets of the vision is that it was usually an animal that was the source of the supernatural power that the Indian acquired during his quest. The power imparted to him was of many kinds: to cure or to kill, to control the weather, to foretell, to become a great warrior, to succeed in love or gambling. Commonly the animal or bird that appeared to the Indian was an embodiment to some extent of the power that he desired and which by his individual temperament he was best suited to use. In this way the vision was not entirely a phenomenon of pure chance but brought on psychologically by "intense wishfulness." This is in line with unpublished psychological experiments carried out by Pollard and Jackson at the University of Michigan in 1961. These showed that the spectacular symptoms displayed by test subjects in short-term deprivation experiments "were primarily obtained by systematically influencing the subject's previous knowledge of the expected experimental results." When subjects knew beforehand that they were expected to have hallucinations they obliged by having them but failed to do so when, under precisely the same experimental conditions, they were misled into believing that the purpose of the experiment was to test a harmless new drug.

Similarly the Indian decides beforehand what he wants from his vision and this is usually the particular power that he ascribes to a certain animal or bird. The wolf, for example, was seen as a cunning hunter and an Indian wishing for success in the hunt sought from the wolf the supernatural — or rather superhuman — power in hunting that it was believed to possess. A more abstract vision was that translated as the Thunderbird, the embodiment of those forces responsible for the vagaries of the weather. The eagle as the Thunderbird, the sky god of lightning and the source of rain, can be traced geographically northwards through America and Canada to Eurasia and chronologically backwards to the Mesolithic. The eagle was the bird of Zeus the Thunderer and of Jupiter Pluvius, both of them rain-makers.

Rather surprising is the association by the Cheyenne and other tribes of the northern Plains of the bear, not with ferocity and strength in battle, but with healing. The reason given is that the bear has long claws with which he digs up the herbs that are used in medicine. Thus the bear is associated with healing powers and members of the Bear Cult that sprang up on the Plains were often called upon to heal the sick. A Sioux medicineman sings in

¹⁶ Arthur Koestler, *The Sleepwalkers*, Penguin Books, Harmondsworth, London, p. 1968, p. 33.

one of his vision-learned songs, "Bear told me about these things." It is interesting to note that Bear Ceremonialism can be encountered all over the world, in regions to the far north and southwards among historic tribes in both the Old and New worlds. Anthropologists believe that it is quite probably related to a Middle Palaeolithic Bear Cult once practised in caves in the European Alps.

The attitude to the animals seen in the vision was often ambivalent. Some animals were sought in visions not to obtain some power *from* them but *over* them: "antelope power" for charming and thus successfully hunting antelopes; "snake power" for obtaining control of rattlesnakes and rendering them harmless. This ambivalence of attitude points up the danger of generalising about Plains Indian religion. Ruth Benedict warns against this and quotes examples to prove her point. "The very great diversity of the vision pattern," she writes¹⁷

even in one culture area such as the Plains is therefore evident. Not only are the general traits unevenly distributed and even entirely lacking in some tribes, but local developments of one kind and another have overlaid the common pattern till it is at times hardly recognisable.

The power granted by animals during the vision came not from the animals themselves but through them from the Great Spirit, the cosmic reservoir, the untranslatable *Tao*. By the Plains Indian the animals were believed to be closer than man to this source of supernatural power and for that reason were considered superior to man. "These lesser beings," writes J. M. Cooper¹⁸, "while ranking a little above human beings and possessing certain superhuman powers, were under the leadership and control of the Supreme Being, from whom they had received such powers to be imparted in turn to human beings."

This attitude is strikingly different from that of the modern Christian, especially the Roman Catholic. To him man is God's supreme creation, even made in his own likeness, and the animals were created solely for his use and convenience. Yet some memory of an earlier attitude more in line with that of the Plains Indians persists in the folk- and fairy-lore of modern sophisticated man. In Grimm's fairy tales, for example, animals are almost invariably a special source of truth and wisdom, like Falada, the faithful horse in *The Goose Girl*, who continues to speak the truth even when his head is cut off and nailed above

¹⁷ Ruth F. Benedict, *op. cit.*, p. 21.

¹⁸ J. M. Cooper, *The Gros Ventres of Montana: Part II Religion and Ritual*, Catholic University of America Press, Washington D.C., 1956, p. 208.

a gate. One thinks of the fables of La Fontaine, many of which he took from Aesop, a thousand years earlier, and many of Aesop's have been found on Egyptian papyri a thousand years before him again. How much further they go back in time is not known for certain but possibly they belong to the dim beginnings of human awareness thirty thousand years ago or more.

Birds are especially endowed with wisdom, as if their power of flight linked them with the gods, intermediaries between heaven and earth. Selma Lagerlöf's young hero, Nils Holgersson, is carried all over Sweden on the back of a wild goose which reminds one of the story in Crow mythology wherein a man is taken to the sun's country by ducks, and of another story in which birds inhabit a mythical land without winter to which an Indian is brought on the back of a crane.

The Druids of prehistoric Wales practised divination from the cries of birds, especially of the wren. If the verdict of a Druid was questioned the wren was called upon to speak and from the verdict of the wren there was no appeal. The modern Welsh word for wren is *dryw*, its etymology associated by some scholars with that of Druid. The practice was not confined to Celtic Druids. The ancient Greek tragedy of *Oedipus Rex* contains numerous references to the use of birds as aids in divination, as when Oedipus appeals to blind Teiresias:

Can you use
Birdflight or any art of divination
To purify yourself, and Thebes, and me
From this contagion?

In the imagery of traditional Hinduism the wild gander is symbolic of the transcendent ground of all being, with which the yogi succeeds in identifying his consciousness. The yogi in his meditation is, as already noted, little different from the Indian during his vision quest, seeking to identify *his* consciousness with the Great Spirit and obtaining power from it through the medium of a bird. In this we find another link with the thought of prehistoric man. In the caves at Lascaux there is depicted a Palaeolithic shaman lying in a trance wearing a bird-mask and with the figure of a bird perched on a staff beside him. Thousands of years later we are startled by an echo from the Stone Age caves. In an ancient Irish vernacular text called *The Siege of Druim Damhghaire* we read of the powerful Druid, Mog Ruith, who is credited with the ability of "causing a tempest or creating a cloud by a mere breath." In the story he wears an *énchennach*, a bird-mask. Wearing this avian garb, together with the "skin of the hornless, dun-coloured bull," (itself reminiscent of what an Indian

medicine-man would wear), the druid “rose up, in company with the fire, into the air and the heavens.”

Bird-flight is taken to symbolise the shaman's, the yogi's, the vision-seeking Indian's, mystic trance. Birds represent souls soaring heavenwards. The angels of Judaeo-Christian mythology are in effect birds: “those almost deadly birds of the soul,” as Rilke calls them.

Stories and mythologies innumerable reveal that in the mind of primitive man there was a feeling that having isolated himself from nature, or within nature, having created an artificial dichotomy between “human” and “natural,” man had cut himself off from a source of wisdom to which the animals and birds, being still an integral part of the natural environment, had easy access. Man had sought to steal wisdom and knowledge from the gods and was expelled from the Garden of Eden for his presumptuousness. The animals who remained content with their lot have now free access to what man attempted to steal for himself and man must go a-begging for it when he needs it. It is the aim of primitive religion, including that of the Plains Indian, and also of much oriental and mystic philosophy, to transcend the arrogant human ego and integrate one's true inner self with the cosmic wisdom, with the Great Spirit of the Garden. In Rilke's words,

... already the knowing brutes are aware
That we don't feel very securely at home
Within our interpreted world.

In his study of *The Indians of Canada* Diamond Jenness¹⁹ points out how “many of the barriers that separated man from nature vanished in dreams and visions, when the sleeper seemed to travel in far distant places and to have contacts with the world of animals that were impossible in normal waking hours.” Modern man has lost this art. To quote Rilke again, this time from the eighth of his *Letters to a Young Poet*, “the experiences that are called ‘visions,’ the whole so-called ‘spirit-world,’ death, all those things that are so closely akin to us, have by daily parrying being so crowded out of life that the senses with which we could have grasped them are atrophied.”

The old tales of every nation seem to relate to a stage before man dug the deep gulf between himself and nature. In these tales, as in the myths of the Plains Indians, animals speak to him, passing on pearls of wisdom, and those who speak to animals and treat them as natural companions are rewarded, while those who revile animals and the confidences of nature are punished. One thinks of the Christian St Hubert and the stag, and of his Persian

¹⁹ Diamond Jenness, *op. cit.*, p. 168.

Sufi counterpart, Ibrahim ibn Edhem, and the antelope; of the enchanted fairy-tale fish that granted all his wishes to the kindly fisherman; of the frog that turned into a handsome prince when the girl accepted without reserve the horrifying repulsive aspect of his life, which the frog represented, and kissed him, as Belle learned to love La Bête and in transforming him by her love conquered greed and evil. In this context the belief among several Plains Indian tribes (strangely reminiscent of the biblical Second Commandment) that sickness and disease may be due to the sins of one's ancestors is interesting, in that the sins responsible for illness in one's descendents include the torture and mockery of animals. This strange attitude to the mockery of animals is found also among the natives of northern Borneo who regard it along with incest and adultery as "severe offences" that would bring on thunder, lightning and floods. And in considering this belief one wonders what exactly Hamlet meant when he charged it to Ophelia, as an offence in women, that they did "nick-name God's creatures."

Among the Plains Indians the animal, bird or natural phenomenon seen in the vision quest, especially at puberty, became the Indian's guardian spirit, the source of supernatural power and guidance, a spiritual mentor and helper, that would remain with him for the rest of his life. The guardian, however, was not always called upon. On those periodic occasions when an Indian went on the vision quest—mourning, revenge, initiation, war-party — the seeker ordinarily received his powers or command directly, without specifically acquiring a guardian spirit. The guardian spirit was usually acquired with the primary or "great" vision at puberty and thereafter there was "an intimate and peculiar relation obtaining between the suppliant and the animal or thing that has blest him in his fast." Among the Crow this acquisition of a spirit helper is formalised in a ceremonial "adoption" by a "father."

"If a man is to do something beyond human power," an Indian once told F. Densmore (p. 219), "he must have more than human strength." This he often got from his guardian spirit. On the Plains, for example, those Indians blessed with a guardian spirit were regarded as bullet-proof and they advanced in battle accordingly. The guardian spirit idea, with only local variations, was prevalent among Indians from the Chickasaw of the south-eastern states to the Eskimo of the far north. It can also be found in eastern Siberia, Australia, the Pacific Islands and West Africa. In fact in all psychic beliefs there is an acceptance, *as a fact*, that everyone has a guardian spirit or guide. Just as the old pagan festivals were taken over by the Church as Christian holidays, so the guardian spirit was taken over as the guardian angel and many

saints were blessed with them. The saints themselves became the guardian spirits of those mortals born on the day that was dedicated to them in the Christian calendar and assumed the rôle of the animals of mythology as intercessors between man and the cosmic power, that Great Spirit known to Christians and to many of the higher religions as God. Christian hymns are full of guardian angels: *

‘Christian! seek not yet repose,’
Hear thy guardian angel say;
Thou art in the midst of foes—
‘Watch and pray.’

Cinderella’s fairy godmother is a Christianised version — at least in name—but Rumpelstiltskin is pure pagan. This is the little man who comes out of the dark sinister world beyond the senses and offers to help in a task known to be impossible. He represents the faith that pushes beyond reason, beyond human evidence, the creative principle unchecked by rational doubt. In modern literature the idea lingers on. Edmund Wilson²⁰ has pointed out that in *Doctor Zhivago*, Yury’s half-brother, Evgraf, “is really a supernatural figure . . . a guardian angel . . . Three times, like the fairy in the folk tale, he comes to Yury Andreyevich’s rescue.” Wilson goes on to describe Evgraf as “Yury’s *alter ego*, his creative, his poetic self . . . Evgraf comes into Yury’s life at precisely those times when ordinary living is becoming too hard to bear and when the effort of the struggle to survive is threatening to overwhelm him.” This is exactly the rôle of the Plains Indian’s guardian spirit. Thus an Aprapaho “went up on the hills naked except for a blanket and during the night prayed and cried . . . A spirit came and said, ‘If you do as I tell you, it will be well.’”

According to the democratic practice typical of the Plains, all men must seek their guardian spirit by way of the vision. All men have personal relations with the supernatural, but some become more successful than others in obtaining supernatural power for healing, procuring desired weather, insuring a successful hunt or war-party. These fortunate vision-seekers, having demonstrated the efficacy of their powers, become medicine-men or shamans. Shaman is a Slavonic word from Siberia where shamanism was prevalent among the Samoyeds and other Finno-Ugric peoples. It was common too among the Eskimos, but most primitive religions recognise some form of the shaman. He is the sorcerer or magician of folklore, the minister or priest of the higher religions.

* In modern psychic studies it is taught that every one has a guardian spirit.—EDITOR.

²⁰ Edmund Wilson, *The Bit Between My Teeth*, Farrar, Straus and Giroux, New York, 1966, p. 442.

The social function of the shaman has been described as serving as interpreter and intermediary between man and the powers behind the veil of nature. But this is directly contradicted by R. H. Lowie²¹:

Yet even they were not generic intermediaries between the laity and the Supernatural but had functions definitely circumscribed by the character of their visions. For example, among physicians some were specialists for childbirth cases, while some devoted themselves exclusively to the doctoring of wounds. Of visionaries blessed with non-therapeutic gifts, some could defy missiles, others could locate a hostile camp, still others were inspired to found a new ritualistic body or to introduce a new type of shield decoration.

Given this religious separatism, there was no universally acknowledged set of dogmas nor any ecclesiastical organisation that handed down laws for the guidance of the religious consciousness. No one insisted that the Crow should believe in the creation myth or subscribe to some accepted conception of the hereafter; nor did a youth require any external prompting to go out in search of a vision. The functions of the shaman, in other words, however important for the public weal, were in their essence private. The Sun Dance pledger, the parents of a sick child, the ambitious brave, all hired a renowned shamanistic specialist according to the exigencies of the occasion. In such cases the shaman naturally assumed complete control as well as complete responsibility.

Towards the end of the nineteenth century there came about a dramatic change in the environment of the Plains Indian. The white men had invaded the grasslands like a plague upon Egypt. Wars and the subjugation of the Indian followed; tribal lands were confiscated, and the tribes herded into reservations like buffalo into corrals. And the buffalo themselves were now almost non-existent. This was the hardest blow of all. With the disappearance of the buffalo, the economic stability and security of the Indian vanished. In their place came want and hunger and an abject dependence upon the cold charity of the white men. The disappearance of the buffalo meant also the end of many of the Indian societies and ceremonials. Buffalo meat had had a sacred character, and among tribes like the Pawnee only buffalo meat could be used in their great rituals. In this situation of stark cultural decay the Ghost Dance appeared like a flash of sunlight among black stormy clouds.

²¹ R. H. Lowie, *Primitive Religion*, Bonni and Liveright Inc., New York, 1924, pp. 15-16.

Arising in Nevada, characteristically out of a dream by a northern Paiute Indian called Wovoka, alias Jack Wilson, from a family of that name with which he lived, the Ghost Dance spread like a prairie fire across the Plains. Beginning originally as a peaceful millennial belief in the return of the vanished buffalo and of the departed dead, hence its name, the movement lost its attitude of brotherly love towards the white man and took up a stance of open hostility. As well as a resurrection of dead forebears, a return of the buffalo and a resumption of the independent aboriginal way of life, it promised also that the white man would be destroyed or driven back from the Indians' ancestral lands "back to Boston." The sanction for these promises was that most basic to the Indian mind: the direct supernatural experience of the vision, one that Wovoka had had when he fell asleep at the time of a solar eclipse, probably on 1st January 1889.

The Ghost Dance religion blazed across the Plains in an ardent revival of war dances and defunct tribal societies; then it died like ember-glow after only two years or so. Shamans of old had had to prove themselves in a practical demonstration of the supernatural powers they had gained from their vision. Wovoka failed. The buffalo did not come back, the dead not return, the white men tightened their grip upon the land. Some tribes had not accepted the revivalism of the Ghost Dance in the first place. To the Navaho, for example, with their almost psychotic fear of death, the dead and all connected with them, the promise of the resurrection of their deceased ancestors was the greatest calamity that could be imagined. Another factor working against the apostles of the Ghost Dance was that Christian missionaries had long been gnawing insidiously at the foundations of Indian beliefs. The Indian no longer gave credence to the seasonal return of the buffalo, nor to the promise of a resurrection of the dead on earth. They had been going to the Catholic missionaries "and had learned different." By the end of 1891 the Ghost Dance was as dead as the buffalo, and for both there was no coming spring.

In the wake of the dying Ghost Dance came the cult of peyotism. For nearly two centuries before the Ghost Dance, peyotism had been spreading, with local variations, northwards from Mexico to the Indians of the United States, and especially to those of the Great Plains. The use of peyote in the southern Plains was reported as early as 1709, but it did not become a general cult until after the final collapse of the Ghost Dance. Peyote is a small, spineless, carrot-shaped cactus growing southwards from the Rio Grande valley. The fact that it had to be imported into the Plains area is probably the main reason for its slow acceptance until the days of increased regular transport. It contains nine narcotic alkaloids, some like strychnine in their physiological effects, others

like morphine, and together producing visual, olfactory and auditory hallucinations, as well as kinaesthetic and synaesthetic derangements.

Peyote is thus a short-cut to the traditional vision, without the isolation, starvation and mortification of the traditional quest. In the same way, Timothy Leary, echoing Aldous Huxley, claims for LSD that it induces the same "oceanic feeling," the same deep religious experience of becoming one with nature and the universe as Zen Buddhists attain by difficult mental and physical exercises. "At the present time," Leary said in a BBC broadcast, "man is so sick that there are very few people who can use the ancient methods," (breathing, fasting, flagellation, solitude and so on) "so that today it is safe to say that drugs are the specific, and almost the only, way the American is ever going to have a religious experience." So it is with the Indians. The easy road of peyotism has replaced the ancient arduous vision quest and, mixed with Christian elements, has developed into the National Church of America.

In adopting the sacramental mushroom the Indians of the Great Plains are once again linking themselves with man's pre-history. In the *Rig Veda*, the earliest work of Indo-European literature, there are ecstatic references to the mysterious vision-evoking plant called *soma*, known also as *haoma* in the *Avesta*, the sacred book of the ancient Persians. By a startling feat of philologico-anthropological detective work, recounted in G R Wasson's book, *Soma: Divine Mushroom of Immortality*,²² this primitive hallucinogen is traced to the fly-agaric fungus known as *Amanita muscaria*. *Soma* was a narcotic mushroom eaten ages ago by Indo-European and Uralic shamans, by Christian-persecuted Manicheans and by eighteenth century descendants of ancient Siberian tribesmen, seeking divine inspiration or contact with the supernatural. Its antiquity is attested by the aboriginal Chinese Taoists whose writings refer to *ling-chih*, the "mushroom of immortality," for which the great emperor Shih Huang-ti searched in vain.

All through this discussion analogies and comparisons have been drawn, some perhaps more valid than others, between the Plains Indian and other cultures throughout the world and throughout history, from the Palaeolithic to the present. From the analogies with Palaeolithic culture some concluding remarks might be made.

In the prehistoric caves of France and northwestern Spain there survives "one of the great artistic achievements of all time," the paintings of our primeval ancestors of 20,000 or 30,000 years

²² G. R. Wasson, *Soma: Divine Mushroom of Immortality*, Harcourt, Brace and World, New York, 1968.

ago. The subjects, drawn with vivid realism and superb uninhibited draughtsmanship, are almost always the larger animals of the time: the buffalo, wild cattle and horses, the mammoth, the bear, the antelope. These animals of the Palaeolithic environment of Europe are those that were hunted also by the Indians of the North American Plains. And the hunting technique may have been similar for both. "From France to Russia," writes Robert Braidwood,²³ "great pits or piles of animal bones have been found. Some of this killing was done as our Plains Indian killed the buffalo—by stampeding them over steep river banks or cliffs." On the Plains the mammoth and the horse early became extinct, but there is some evidence that a memory of the mammoth and of the mastodon survives in Plains Indian mythology.

Zoologists, botanists and biologists have the benefit of fossil remains in recreating the evolution of the species that they study. Archaeologists reconstruct the cultures of the past from the monuments that remain. Thoughts, ideas, beliefs are immaterial, intangible things, the breath but not the staff of life. They leave no shells in settled sediment, no fossils bedded deep in boulders, no crumbling clay or mounded tombs. Or do they? Is it merely fancy to regard the religion of the Plains Indian as a fossil of the religion of our Palaeolithic ancestors, to see in it the very beginning of religion? Carried eastwards across the steppes of central Asia, surviving the cold Siberian wasteland, the crossing of the Bering Strait and the Ice Age of North America, the prototype religion lived on in the complete isolation of this continent, unaffected by the developing sophistication of European and oriental philosophy and of scientific enquiry.* Yet buried deep within the culture of technological man there rest some faint survivals from his primitive past, like barely perceptible radio-waves from distant stars. A number of these tiny and quickly disintegrating fossils have been scattered through this essay, tiny cultural phenocrysts of folklore and religion, literature, mythology and childhood animism. As the developing human embryo is said to go through the stages of

²³ Robert J. Braidwood, *Prehistoric Men*, Morrow and Company, New York, 1967, p. 74.

* The evidence seems to suggest that the religious beliefs and ideas of Palaeolithic man of Europe and Western Asia spread, as the author suggests, outwards into Central and Eastern Asia and, ultimately, into America. The Amerindians cannot be considered as the descendants of the people of the Dordogne, who were undoubtedly of the Caucasoid stock, probably proto-Atlantic in type. On the other hand the primitive religion found among these early Caucasoids of western and central France, did reach the Mongoloids, and from them the Amerindians. As a consequence many of the religious ideas found among the Plains Indians record ideas of 20,000 or more years earlier among Cro-Magnon and related stocks.—EDITOR.

human corporeal evolution, so the developing human mind may go through the stages of man's intellectual evolution. The Child, in other words, is truly "father of the Man." Jung's concept of archetypes would appear to support this view.

If these speculations are valid, then religion has its origins in the childhood of man, in the mystic visions of our animist ancestors retold as myths and re-enacted as ritual. As man's cultural, as well as natural, environment changed, so, imperceptibly, his religion changed. On the Plains of North America, over the thousands of years of human habitation, change in the physical, cultural and intellectual environment came with extreme slowness. Apart from the cataclysmic extinctions of the larger Pleistocene fauna, the most important innovation before the white man from Europe invaded his land was the substitution of the stronger and speedier horse for the dog. Though the cultural consequences of this change were far-reaching, it was basically only one of degree, a somewhat higher input of energy into the Plains ecosystem. But with the large-scale incursion of the European, the Indian was suddenly exposed to a rapidly expanding technology: the rifle, the railway, the material products of the Industrial Revolution; to alien institutions like centralised government, church and schools; to a completely new culture and way of life. His religion could no longer keep pace with the bewildering changes in his once nearly static environment and he floundered hopelessly, like a non-swimmer tossed into deep water. Many sank out of sight and were drowned; some, as a matter of survival, learned to swim, however awkwardly; others, in a brief, bright optimistic vision, struck out for the old familiar shore where they had been so happy once, only to lose hope utterly when they saw that the shore was no longer the hospitable place they remembered.

CORRIGENDA

In Vol. XIV, No. 3, on Page 161, line 2: for "idon" read "iron"; on Page 162, line 1: for "lays stress in Zeus" read "lays stress on Zeus"; on Page 171, line 30: for "whom he thinks" read "who he thinks" and line 33: for "Palesgians" read "Pelasgians"; on Page 174, line 41: for "mariners" read "manners"; on Page 175, line 14: for "and a Timbuctoo" read "and Timbuctoo"; on Pages 176, line 22: for "(or Ceres to Greeks)" read "(or Ceres to the Romans)"; on Page 179, line 19: for "Gatae" read "Getae"; on Page 156, line 34, and Page 161, lines 40 and 46 for "Pindor" read "Pindar."

Professor Sergio Sergi:

1878-1972

One of the most eminent scholars in the Sciences of Man has recently disappeared; Professor Sergio Sergi of the University of Rome died on 22nd June 1972. He was the son of Professor Giuseppe Sergi, the anthropologist of world fame, who died in 1936 at the age of 95.

Sergio Sergi was born in Messina, Sicily, in 1878; he became a M.D., and assistant of his father at the Institute of Anthropology of the University of Rome. He took a great interest in the study of the nervous system, attending also Berlin University (1906-07). The results of his studies were two large volumes: *Cerebra Heretica* (1909) and *Crania Habessinica* (1912). He turned then to psychiatry and the investigations in this field, attracted also by the Lombroso school of criminal anthropology. In 1909 he was appointed Director of the Roman Hospital for the Insane (Santa Maria della Pietà). During the First World War he served as a lieutenant-colonel in the Royal Medical Corps.

In 1916 his father retired and he was then appointed in his place. In this new position Sergi gave the most energetic impulse to anthropology. At this point it should be noted that in the Italian scientific world anthropology is intended as only physical anthropology. He could avail himself of the new and large Anthropological Institute in the new University City built by Mussolini. He was also successful in his strenuous efforts to increase and develop the study of anthropology in the various Italian universities.

In 1939 an event gave a special direction to Sergi's studies. It was the discovery of the skull of Saccopastore, the first Italian Neanderthalian skull, followed by a second Saccopastore (1935) and by the Circeo skull, found by Professor Blanc in 1939. Sergi studied deeply these remains and published a great number of papers and some books on the results of his studies.

When a young man he had a strong feeling for the fate of Greece under the Ottoman domination, and in 1897 he joined the Garibaldine volunteer corps and fought in the Domokos battle (11th March 1897). On his retirement Professor Giuseppe Genna was appointed to the chair (1953).

Sergio Sergi was a very charming and courteous man, who combined the manners of a Sicilian gentleman with the high qualities of a scientist. He was alert and prompt in his treatment of requests and replies; he possessed a vivacious character as

well as a very strong personality which emerged visibly in all congresses and symposia which he attended or of which he was president. The writer was his assistant for many years and he remembers clearly the brisk figure of Sergi going around the institute and overseeing the work of us, his collaborators; he had a good word or an appreciative judgment or an encouragement for each of us.

MARIO CAPPIERI

The Syro-Mesopotamian Ethnology

as Revealed in Genesis X

By R. GAYRE OF GAYRE

The writer of the tenth chapter of Genesis is the father of ethnology. There are in the Church today many elements which consider that the tenth chapter of Genesis has no connection with modern ideas. The author in a detailed analysis shows that chapter ten is indeed relevant to us today. He concludes that Genesis X does not support a mongenetic origin for man and was a serious attempt to classify the races with which the account was concerned on a definite genetic basis.

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THE ARMORIAL

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SCOTLAND

Book Reviews

THE ORIGIN OF THE ZIMBABWEAN CIVILISATION

By R. Gayre of Gayre. Galaxie Press, Salisbury, 1972. Pp. 248, many illustrations in colour and black and white. Price \$Rh.9.00.

Professor Gayre already has written some papers on the Zimbabwean ruins, and on the population who originated the Rhodesian ancient civilisation. Now he has compiled an extensive documentary study on the subject, giving logical explanation of the various problems which arise during such investigation. The elements of Professor Gayre's study are: (a) the ruins of the Zimbabwean civilisation; (b) their age; (c) the civilisation they represent; (d) the population who created it; (e) the dwindling of it.

The Rhodesian ancient ruins: The ruins related to this ancient civilisation are: (1) some rather sparse settlements in the southern region of Rhodesia (Naletali, Khami, Dhlo-Dhlo, Great Zimbabwe); (2) the settlement of Van Niekerk, very much isolated in an uplandish terraced region, also very ancient, called the Inyanga Terraces, located in the north-eastern region of Rhodesia.

Practically in all these settlements the most prominent element is a wall circuit, generally oval or elliptic, very well built with stones trimmed and fitted to obtain the regular course which shows some masonry decoration as cord, herring-bone, chevron, and chequer-board. Within the wall-circuit, there are generally some cement platforms for huts or workshops.

The external wall of the Naletali settlement forms an elliptical circuit of 58 metres across the main axis; it is over three metres high, and carries on the summit some granite monoliths; it encloses also some platforms. Very few objects of interest were found in these ruins: small articles in copper and iron, as the robbers have visited them frequently.

The ruins of the Khami settlement are rather extended, along the Khami River. There are 14 groups of walls. One of the groups (No. 1 hill) is built on three different levels, one above the other. The citadel, on the highest level, is 66 metres long. In the area of the ruins there are cement platforms in various positions. Though robbers have visited the ruins many objects have been found, objects and articles in gold, copper, and iron.

Unlike the other settlements, Dhlo-Dhlo is located on a high site and shows the appearance of a fortified village. The many walls, sometimes in double course, have the built and decorative course already mentioned. The herring-bone course of stone at the superior part of the wall is similar to that shown by many Sardinian nuraghi. Within the wall-circuit there are many cement platforms. Gold, silver and copper objects were found in large quantities in these ruins. Many ancient graves have been excavated; the skeletal remains were laid full length and cemented over in a manner entirely foreign to the traditional flexed position adopted in Bantu burials. There were also some signs and objects of the Portuguese occupation of the settlement, among them two bronze guns.

The settlement of Van Niekerk and Inyanga forms an extensive area of walls, forts, platforms, and terraces, which are not only a huge complex of ruins, but form vast agricultural terraces of many square kilometres. The site is rather upland, on the slope of Mount Ziwa (1900 metres). Some parts of the ruins form true forts, strategically situated on the numerous hills of this settlement. There are many cement platforms for huts and workshops, as is usually found in all these ruins.

Many objects of lithic and iron industries have been found; they represent perhaps two distinct ages of man-occupation, or different stages in evolution of the inhabitants. There is no trace of a Portuguese presence. The settlement was very isolated; it can be presumed that the end of it occurred before the fifteenth century A.D.

Surely no Bantu reached this region, because the Bantu, who lived in an African tropical zone before their expansion southwards, disliked the cold and damp climate of the highland region of Inyanga.

The inhabitants of this settlement, and particularly those of the terraced highland, were very able agriculturists, showing a most intelligent and skilful way of terracing their land, and a practical knowledge of canalization and land hydraulics, proved by the many dams, land-excavation, and working-irrigation, still existing.

The ruins of Great Zimbabwe are remarkable for their size and relatively good preservation. The building stone of all the structures is the granite of the site. The settlement is composed of two distinct groups of buildings. The first consists of a great oval circuit-wall, about 252 metres in circumference, and 10 metres high. The wall has three entrances. Within this circuit there is another wall 90 metres long, practically parallel to the other as the space between them varies from 90 centimetres to 1.20 metres. The half-enclosed area, rather large, called "The Sacred Zone" or "The Temple", encloses a big structure, the so-called "Conical Tower," a cone of solid masonry 10 metres high.

About 100 metres from this part of the settlement there is on a hill the so-called "Acropolis"; a steep stone-stepped way leads up and through crevices in the rock to the crest of the hill which is strongly fortified with a parapet of immense strength. Along the wall there are some pillars having on top sculptured birds.

The excavations of the site proved a prolonged occupation by people living in huts and already using iron. The inhabitants were the gold miners of the zone, and perhaps there were two strata of population, in a social sense. The large number of photographs in the book, showing the essential aspects of all these Rhodesian ruins, give to the reader a sufficient knowledge of them. The brief, but very interesting, archaeological study by Layland completes the external vision of the ruins.

The author, very reasonably, points out that all these settlements were formed by a homogeneous population of a superior intellectual level, who were primarily gold miners, but were also very able agriculturists and land-hydraulicists. The ingenious way they built up the wall of their settlements in oval circuits shows their intelligent defensive system. Many of these ruins show a remarkable knowledge of the possibilities given by fortifications skilfully located.

In many ways these ancient Rhodesians could be compared to the prehistoric populations of the Mediterranean civilisations, in particular to the proto-Sardinians; many of their constructions have a vague similarity with the Sardinian nuraghi.

Two pieces of wood extracted from the megalithic structure of a settlement tested by Carbon-14 gave the dates, respectively, of A.D. 590 and 702. At least we can count on two dates to express the temporal curve of this cultural development. It could be that the original foundation of the settlement, or the beginning of the building up of the various structures, go back many centuries, and even a millennium, but there are no clues to propose such theory.

Dealing with the question of the ancient population, Professor Gayre settles two distinct points: (a) rejection of the Bantu myth; (b) the presence of a non-African population, or at least a non-Negro settlement.

The author, in a well developed discussion on both these aspects, assisted by a formidable documentation, shows that the Bantu have

nothing to do with this civilisation. First, because of the ages which are diverse. In fact the Bantu began to move southward from the Great Lakes about the sixth century A.D., and they were in Rhodesia presumably not before 1200, when the civilisation had already vanished long since. Second, the author, supported by the opinion of eminent scholars, such as Keane, Dart, Galloway, Bent, and Murdock, shows, in two interesting chapters, how the rural life of the Bantu could not be identified with that of the population of the Rhodesian settlements.

The culture, life and society of these Negro were at the opposite poles to those of the inhabitants of the settlements as much as we infer from the study of the ruins. There is not a minimum of evidence to show that the Bantu were ever responsible for megalithic buildings; it is also impossible to consider the hypothetical idea that the Bantu, after having such prominent qualities and having created the Rhodesian civilisation, could pass through an intellectual involution to the cultural level we know, living now in round or beehive-shaped huts, without any idea of walled place.

Undoubtedly the advanced technology of the ancient Rhodesians shows them to have been well above the primitive level of the culture that Bushmen and Hottentots displayed at that time.

It is very difficult to suggest the probable origin of the population who created the ancient civilisation of Rhodesia, because we possess no element about it. The author, after dismissing the Bantu theory as unsustainable, presents all the possibilities of tracing such a population. He analyses each of them very thoroughly, with rich documentation and adequate discussion. He does not insist on the hypothesis that the Zimbabwean civilisation is the result of the cultural development of more than one racial stock. He is right in assuming that this civilisation has been created not in a single moment as a whole, but in successive stages, the trend of which was different from settlement to settlement; this aspect is particularly clear in the Great Zimbabwe ruins.

The aim of the population of these settlements was obviously the excavation of the gold mines, the collection of the product, and the successive export and/or working of it. The author concludes his discussion proposing two eventual ways of immigration of such population into Rhodesia — overland and by sea. After his long study on this point, he advances the thesis that these peoples were the Semitic Sabaeans or the Ethiopians or both.

As it is impossible to be certain on this subject, logical solutions only can be advanced. Professor Gayre has the merit of having proposed the most plausible and less complicated solutions.

At some point in the course of history the Rhodesian ancient civilisation seems to vanish away and the settlements remain deserted. The author assumes that: (a) the period A.D. 1005-1375 formed the third phase of this civilisation, at least at Great Zimbabwe; (b) before A.D. 1400 the flourishing of the settlements ended.

He ascribes the end to some main causes, *i.e.*: (1) to the declining gold production; (2) to internal population problems and demographic involution; (3) to external assault and invasions.

The gold extraction was surely constantly reduced because of the water-table limit which affected the depth of the mines. As a consequence the economic conditions of the inhabitants changed, influencing their demographic factors, and the social balance which was a very important problem in each settlement-society, divided into freemen and slaves.

The variation in each population obviously caused a heavy imbalance in the sex-proportion and in the size of the age-classes, with subsequent demographic involution. There were also inevitable conflicts with invaders

who, by the author's assumption, were the proto-Tonga, the Karanga, and other Bantu.

In such a time the Arabs of the eastern African coast counted on a great influence even in the inland regions, obviously also in Rhodesia. But at the beginning of the sixteenth century A.D. the Portuguese, in their progress in these regions, destroyed the Arab power and came into contact with the desert settlements of the ancient civilisation.

The author advances the thesis that the Lemba, who seem now to approach willingly the centres of our modern civilisation, are perhaps the descendants of the Semitic Sabaeans who founded the ancient Rhodesian civilisation.

The value of Professor Gayre's book is both scientific and literary. As an ethnological investigation corroborated by a formidable documentation, the book represents a precious addendum to the studies of the subject because Professor Gayre is highly competent in the ethnology of African populations and African Negro. But his book is also agreeably written so that any layman of moderate culture can appreciate his description of places and people.

This volume honours the printing industry. The splendid paper, the very good and readable types, the many splendid colour photographs, and the perfect balance of the material show an editorial care of a superior level.

The volume contains 20 chapters written by Professor Gayre, an archaeological appendix compiled by Layland, a rich bibliography and an index.

MARIO CAPIERI

THE SYRO-MESOPOTAMIAN ETHNOLOGY AS REVEALED IN GENESIS X

By R. Gayre of Gayre. The Armorial. Edinburgh, 1973. Pp. 64. Price £1.50.

In this small book the author resumes, as he says in his foreword, some aspects of an extensive research, which he carried out at Exeter College, Oxford, before the war. It is "only the result of my research in those days," so he declares expressly, and this may be the reason why he does not refer to the article I have written myself on this subject, which was published in Vol. VII, No. 3, January-March 1967, of this magazine.

As a comparison of both disquisitions is instructive, I will take it as the starting-point of my review. In my article I took it for granted, not only that the famous "Table of Peoples" of Genesis x was designed in the sixth century B.C., but also that it reflected wholly the ethnology of the Near East at that time. Professor Gayre of Gayre, however, while admitting the first part of my presupposition, maintained that "Although it was collated, elaborated and annotated at a late date, parts of it contain elements which presuppose a patriarchal dating" (see his footnote to my article on p. 144). In his present work he gives arguments that can support his opinion.

The author thinks "that Genesis x is the earliest comprehensive account of the nations of the ancient world" and that "it throws light on the situation early in the second millennium in particular" (p. 18). *i.e.*, the time of the patriarchs. A first ground for this assumption he finds in the fact that the Table contains "curious anomalies" (p. 16), such as the history of Abraham, his origin and kinship, as related in Genesis.

Abraham came from *Aram-Naharaim*, *i.e.* Northern Mesopotamia and North Syria, a country that was overrun, between B.C. 2000 and

1700, by Indo-European (Nordic) tribes, who conquered the indigenous Hurrians (of the Armenoid race), to reign over them as a military aristocracy, at a later time known under the name *Mitanni*. From there came the Hyksos, who conquered Egypt in about B.C. 1700, while other bands, known as Amorites (*Amurru* or *Martu*), penetrated into Babylonia and gave to that country a new dynasty. There is also every reason to suppose with the author, that Abraham — who is described as a great war-lord — was a Shepherd King of Aryan descent, who came to Palestine in the wake of the Hyksos-migration (pp 30ff). And as Abraham is explicitly named a Hebrew, this affinity must be ascribed also to this people, the *Khabiru* of the Tell el Amarna letters.

It seems to me that the author is on the right lines when he sees in the history of Nimrod, the son of Cush, the reflexion of "an early extension of the Hamitic-Semitic speaking peoples into Babylonia before the immigration of the Shemitic or Indo-European tribes" (p. 40). If this is true, we have here before us an other historical element of a very early date, but in that case the descendants of Nimrod cannot have been the creators of the first Babylonian state, its civilization and language, as is suggested elsewhere (cf. p. 58).

It may be that Professor Gayre is right when he thinks that several of the geographical names which occur in the Table originally referred to the North, thus Sheba (p. 40) — at a later time identified with the Yemen — Havilah (p. 40) and Cush — originally Kish in Mesopotamia (p. 58). Nevertheless he admits that these names later, when the geographical horizon had widened, were transferred to the regions and countries in the South, to which they traditionally belong.

Although the existence of kernels of a very old date is not to be denied, I have the impression that the author lays too much stress on them, neglecting sometimes the additions and alterations of the sixth century B.C., which gave to the Table its present form, I will illustrate my impression by two examples.

In his review of the sons of Shem the author supposes that the Assyrians (*Asshur*) were originally dominated by an Aryan aristocracy and this is one of the arguments on which he bases his thesis, that this group of peoples does not represent the Semites proper, but a heterogeneous group of peoples partly of Hamitic, partly of Aryan descent (pp. 19 ff.). Could however an author living in the sixth century B.C. have any doubts about the purely Semitic character of the folk of Assur?

In the sons of Japhet, Professor Gayre sees predominantly peoples of Alarodian (or Subaraic) speech and Armenoid race, admitting however that Gomer is to be identified with the Kimmerians — the *Gimirrai* of the Assyrian inscriptions — and Javan perhaps with the Ionians. The invasion however of Indo-European cavalry — peoples from South Russia, the Kimmerians and Scythians, into the Near East in the seventh century B.C. must have made a mighty impression on its peoples (cf. Ezekiel 38 and 39). Therefore it seems to me that I was right when I concluded in my above-named article that Japhet stands in the Table for peoples of Nordic race and Indo-European speech, if we except Tubal and Meshech, who were to be identified with the Tibareni and Moschi of classical authors.

Notwithstanding these criticisms, I consider this work with its rich and everywhere interesting contents as a valuable contribution to our knowledge of the ancient ethnology of the Near East, a branch of science that is indispensable for the right understanding of the Old Testament.

F. J. Los

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